COMPUTERWORL

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/year

May 7, 1975

By Edith Holmes

Of the CW Staff

cialists acting as advisors to the

South Vietnamese government

were among the last Americans

to leave this city just hours be-

fore President Duong Minh sur-

rendered unconditionally to the

Provisional Revolutionary Gov-

ernment (Viet Cong) last week.

SAIGON - Two computer spe-

Equipment Stays Behind

Vol. IX, No. 19



Test Your Knowledge

That's the message Univac had for visitors at the recent Hanover Fair, the biggest DP show in Europe. Other photos on page 6.

But White House Unperturbed

By Don Leavitt Of the CW Staff

WASHINGTON, D.C. - By the end of April - six months after legislation calling for a two-year National Commission on Electronic Funds Transfers signed by President Ford [CW, Nov. 27] and only six months before its interim report is due - the commission had not yet been named.

While a White House source seemed unperturbed by the delay, the House of Representatives' Subcommittee on Financial Institutions is more than upset. "We are not only concerned, we're very disturbed," Ellen Larkin, a subcommittee staff assistant, said.

"We've written the President and the Comptroller of the Currency numerous times, urging the President to at least appoint an acting executive director, perhaps from among the experts in each of the regulatory agencies," she said.

and feel that some precommission staffing could be done so that it could start accumulating the information and studies that have been written to date on electronic funds transfer systems [EFTS] and determine exactly what developments are in existence now.

"But that hasn't happened," she said, "and each agency has continued to go its own divergent way with its own type of experimentation." The House subcommittee is "not opposed to experimentation as such.

"We recognize EFTS is here there's no denying that. But we feel experiments should be con-In the a trolled experiments, carefully monitored, a lot could happen in

two years, good or bad. "And we are very concerned about the possible bad aspects of uncontrolled experiments," Larkin said.

The subcommittee may hold hearings on EFTS in general and on the various "moratorium" proposals in particular by mid-May, but Larkin views the call

for an absolute moratorium as a gesture to tell the Comptroller of the Currency that his ruling last December [permitting national banks to put automatic banking units anywhere they wish, without having the units considered branches] is in direct contravention to the will of the Congress as expressed in the bill establishing a national commission," she said.

We want assurance that experiments will be controlled. And the hearings may help us see how to do this in the absence of a national commission," she added.

For its part, the White House office responsible for screening possible commission members noted that various recommendations have been received to fill (Continued on Page 3)

Employed by the Californiabased Computer Sciences Corp. (CSC), the two members of the CSC team of 12 in Saigon closed their advisory office to the Government of Vietnam (GVN) Computer Center when other nonevacuation-oriented U.S. operations terminated on Monday, April 28

DPers Last to Leave 'Nam

A spokesman for the company "presumed they left" with the airlift out of the country the next day.

CSC's people had been in Vietnam since the end of last year, when their company acquired the contract to help the GVN Computer Center develop logistic, inventory and financial systems "for maintaining the cost-effective management of U.S. materiel supplied to South Vietnam under the agreements made in the Paris Peace Treaty,' the spokesman said.

"Our operation was concerned with the proper distribution of the goods sent - whether food or arms," he added.

CSC picked up the contract to

aid South Vietnam last December when the Southeast Asia Computer Associates (Seaca) in Honolulu lost its contract of several years in a bidding procedure.

Equipment Intact

"At the time our contract, and thus our involvement, ended, all of the equipment was intact and the Vietnamese had assumed most of the operational and managerial functions," Norman Rezendes of Seaca said. Located in the prime minister's office. the GVN Computer Center was built around an IBM 360/50 and operated on a 24 hour/day basis,

"By the end of 1974, we only had five people actively involved in the day-to-day operations of the center. A team of 12 additional people performed the core of our work there, which consisted of classroom training in advanced computer techniques." Rezendes stated.

He indicated that all decisions (Continued on Page 3)

Critic Says Has

By Patrick Ward Of the CW Staff

WORTHINGTON, Ohio -Chances for midair crashes between passenger planes will increase unless the Federal Avia-Administration (FAA) slows implementation of its radar data processing (RDP) traffic control system, an air safety critic has charged.

Although increasing air traffic "We've provided initial funding is making the RDP systems necessary, the FAA is rushing them into service while they still have hardware and software bugs, according to John B. Galipault, president of the nonprofit Aviation Safety Institute (ASI) here.

In addition, controller training is too short, and too much "on the job," he charged.

As a result, the RDP systems have gone into use without adequate consideration for the traveling. public; people are being used as "live test subjects," he

"The process has produced numerous hazardous conditions and potentially deadly situations that have barely avoided the loss of countless lives," Galipault stated.

He cited an example where a Boston control region was told of a plane coming into its area at 6,000 ft. The plane did not show on the RDP screen, however, and the controllers forgot about it when other work distracted them.

Another plane entered at 6,000 ft and did appear on the CRT. Boston Approach called the controllers to make sure they knew the two planes were 10 miles apart and closing. The controllers were not aware of it and told Galipault there could have been an accident without the call.

But an FAA spokesman said, "We're convinced this is a safe and efficient system handling more than 22 million flights annually with a very high degree of safety." He denied travelers are

360/40s Join 3330 Club used as "live test subjects."

By Vic Farmer Of the CW Staff

SAN FRANCISCO - IBM 360/40 users were welcomed to the 100M byte/spindle disk drive club last week when Itel announced its sloweddown IBM 3330-type disk drive for the Model

Itel claimed the drive, which operates at 625 kbyte, also enhances the Model 40's throughput to a level equal to that of a 370/125.

Itel previously offered the drives, the 7330-2, and controller, the 7830-2, on 360/50s, but recently the firm was able to upgrade its 50 ibility to full-spe 3330-type drives [CW, March 19].

The only real difference between these drives is that the 7330-2 rotates the pack at 2,800 rev/min and the full-speed drive rotates at 3,600 rev/min. Packs are compatible with IBM 3330s, Itel said.

Utilization of the drives requires Itel's Transparency Mode 370 (TM 370), a modification of IBM's DOS Version 27.

TM 370 did, however, require reworking to put in "basically what would be called a machine check handler," an Itel spokesman said. "Certain functions caused red lights on the console and new software was able to circumvent channel interface checks.'

Eight drives can be placed on a controller, and up to eight controllers can be used on a 360/40 channel.

The Itel spokesman candidly admitted Itel was not too sure at first how the 40 would react to the 625-kbyte drive, but he said that, since the memory speed itself of the 40 is capable of doing 800 kbyte, there is a "pretty fair margin" with which to work.

Model 40 with 120-kbyte tape drives on the second channel along with two printers and a card reader/punch. "We get occasional overruns in which the CPU temporarily is unable to handle the data rate, but the software retry normally handles this problem," he said.

"But overruns of this type would also occur if the Model 40 had a couple of IBM 2319s on it," he added.

The 100M-byte spindles have over three times (Continued on Page 2)

Narrow-Band Radai

The RDP system is also known as narrow-band radar, in that it narrows down, or is more selective in what it displays, than previous "broadband systems," Galipault said.

RDP systems use a digital computer and complex software to process radar signals. Rather than representing an aircraft with moving blips on radar screens, RDP systems use alphanumerics shown on CRTs.

The RDP systems also link the aircraft representations with data blocks that note the plane's call sign, airspeed, altitude and other data.

With broadband radar, controllers hand-write such information on plastic cards, called "shrimp boats," which they attach to radar screens.

The FAA has spent \$120 million on RDP research and devel-

(Continued on Page 2)

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By U.S. Chamber of Commerce

'Gentle Art of Arm-Twisting' Automated

Of the CW Staff

WASHINGTON, D.C. - Computer technology is being used here by the U.S. Chamber of Commerce to bring the gentle art of legislative arm-twisting to the level of a highly organized multifront offensive.

The Chamber, which already maintains names and addresses of its mailing list of 250,000 persons, 50,000 members and 970,000 magazine subscription holders on magnetic tape, is bringing up a new system linking individual congressmen with influential chamber members in their districts.

When a bill whose outcome the Chamwishes to influence is introduced, Chamber lobbyists determine which congressmen are wishy-washy on the issue. Then, with a couple of simple batch runs on its IBM 360/40, the Chamber can send letters or initiate mailgrams to each Chamber member in the key congressmen's districts, instructing them to contact the lawmakers.

Suppose, for example, the Chamber wished to pressure Sen. Lawton Chiles (D-Fla.) on a bill that would limit the amount of money that could be spent on business entertainment.

The computer operator would simply feed the 360/40 the senator's code number on a punched card. The machine would produce a list of all Chamber members who own businesses in Florida and so might be persuaded to bear down

The list, printed on a stack of mailing labels, according to DP Manager John Willging, could be quickly fixed onto envelopes stuffed with instructions on the legislation for forwarding to the members.

The Chamber can also quickly prepare such a list of key members on magnetic tape for use in sending mailgrams.

The computerized list is not yet complete, according to Willging. To date, Chamber members, who are primarily corporate executives, have received a letter from Hilton Davis, manager of Legislative Action, asking them to "indicate those senators and representatives with whom your company has a constituent relationship...That will permit me to signal the right people when a special need arises for assistance with specific legislation."

Names provided by these executives will go into the computerized list and, when needed, some of these will even be tapped to come to Washington for a personal touch, a source said.

Davis explained there is "nothing illegal" about what the Chamber of Commerce is doing - recent news stories have blown the project "totally out of proportion.'

Critic Says FAA Control System Has Not Yet Been Fully Debugged

(Continued from Page 1) opment and \$538 million on hardware and facilities, the FAA spokesman said. IBM was the prime contractor on computer hardware and software. Raytheon provided the radar systems.

First RDP installations were in the Los Angeles and Kansas City areas in March 1974. Seventeen of the nation's 20 enroute traffic centers are already equipped with RDP, the spokesman said.

The FAA is rushing the RDP systems into service too soon "to placate Congress and demonstrate that it has effectively implemented a system within the scheduled time frame," he stated.

The RDP systems depend on programming, he said, and problems can occur when the systems meet situations they weren't programmed to handle.

This can happen, for instance, "when an aircraft outruns the acceptable limits the RDP places on altitude variation . . . between displayed updates," he said.

"Lear jets and military fighters consistently outrun the system," he said. When that happens, the CRT's altitude readout is canceled out until the control-

ler can manually correct the situation. Also, most aircraft that do not have transponders, devices which enhance their radar signal to the ground, are not going to be seen on narrow-band radar, Galipault said.

Other problems include target (aircraft) swapping; data block swapping with other aircraft and with false targets; floating of data blocks away from assigned targets;

Communications Products Run Gamut at Interface '75 . . . 19

Direct User Interconnection Planned in Canada 19

incorrect data blocks; video display clutter; and data blocks which on a crowded screen overlap and become unreadable, he

Target symbols can also be displayed. displaced from the actual plotted location of the aircraft by as much as 20 miles, he said. Another problem is the system's failure to alert the controller that part of the system has gone down, Galipault

Software fixes have to go through the FAA, and these will take considerable time, he stated.

Galipault said every site installing RDP goes through a shakedown phase with the broadband system close at hand so the controllers can see both. Control centers do this shakedown with live traffic "when they really don't know enough about the system," he said.

Next comes the operation readiness demonstration (ORD). At this stage, the facility chief certifies the system, noting what problems there are. In October 1974, Chicago went to ORD with 37 major and minor discrepancies, Galipault

After ORD comes full operation. "Almost all of the U.S. is in either ORD or full operation now," he said.

Galipault said he has numerous other anonymous reports from air traffic controllers that show the risks in RDP.

The ASI's charges are "all based on anonymous reports which we can't verify," the FAA spokesman said.

Big Disk Fit to 40

(Continued from Page 1) the capacity and twice the data rate of the IBM 2314s. Access times are two to three times faster than those of the 2314

By use of a two-channel switch, the drives can also be shared with a 370 system, Itel said.

In its benchmarks of a 256K 40 against a 256K 125, Itel found that, in heavy CPU-oriented jobs, the 40 was better, but in heavy I/O work the 125 was somewhat faster. These benchmarks did not use any virtual memory capability.

The 7830-2 controller costs \$84,700 or \$1,770/mo on a two-year lease; 7330-2 drives cost \$29,550 or \$700/mo on a two-year lease.

Itel also supports its modified DOS/VS Version 29 on the Model 40 with 100M-byte drives.

Itel is at One Embarcadero Center,

Correction

Memory Makers Report Lowered Results38

The Komand-Data Acquisition System package cited in "Measurement Tools Vital at All Sites" [CW, April 23] is marketed by Pace Applied Technology, Inc., Arlington, Va.

On the Inside This Week

NEWS SYSTEMS & PERIPHERALS Florida Pondering Voluntary Certification Bill4 Pilgrimage to Hanover - A Photo Feature 6 Planning Pays Off in Moving 370/168s 20 Miles 24 Swamped DP Centers Delay Unemployment Checks8 Bankamericard Ends Paper Exchanges of Member Banks . . . 9 MINIWORLD **EDITORIAL** System/32 Users Won't Hire Outside DPers25 CMI Introduces Dual-Speed, Plug-In Memory for PDP-11 .26 Media III Provides Nova-Based System, Peripherals 27 **COMPUTER INDUSTRY SOFTWARE & SERVICES** U.S. Exhibitors Optimistic About European DP Market . .28 'Gemini' Builds Edos-Based Multiprocessor Systems13 IBM to 'Produce More With Less': Cary28 Tally Sees Growing Mart for 300 Line/Min Printer31 COMMUNICATIONS FINANCIAL SNA Creates Uniform Net Environment17

Six Months Past Creation, EFTS Commission Unnamed

(Continued from Page 1)

those positions on the 26-member panel not specifically mandated by the enabling legislation.

legislation.
"But, at the moment, we have not been able to locate a chairman, and I think that is probably the major problem,"

according to an assistant to personnel director Aaron Spaulding.

Spaulding apparently has contacted various potential chairmen. Though they haven't turned him down, "they all feel they have conflicts of interest" that would prevent them from serving effec-

military equipment abandoned in Viet-

nam, there was understandably not much

concern for what happened to the com-

puter installations while people's lives still

hung in the balance, Reilly commented.

before events in Vietnam will encourage

speculation or permit awareness of what the new government will do with all that

was left behind.

And it will probably be some time

tively even if they were approinted by the President and approved by the Senate, the aide said.

The delay didn't seem to bother the aide. Though the bill setting up the commission specified a two-year life span for the group, "that can be extended, so that's not a major problem," according to Spaulding's office.

There is, in fact, nothing in the language of the enabling legislation requiring that the chairman of the commission be without conflict of interest. The law specifies "the chairperson shall be designated by the President at the time of his appointment from among the members of the commission and such selection shall be by and with the advice and consent of the Senate" unless the appointee is already in an office to which he was appointed with the approval of the Senate.

While the commission specifically includes various federal and state officials and representatives of the various banking and financial institutions — any one of

mhom, legally, could be named chairman — the panel also should include five people from the private, nonfinancial sector. It appears now that the chairman is to be drawn from this portion of the commission, if Spaulding's office can find people to qualify.

The enabling legislation is more stringent in its demands on these members. They must be individuals who are "not affiliated with, do not represent and have no substantial interest in any banking, thrift or other financial institution including, but not limited to, credit unions, retailers and insurance companies."

Though unhappy about the delay in naming the commission, a source at the American Bankers Association recognized the White House apparently is "having trouble finding five who know enough about EFTS and who have no interest in banking. When you consider that a lot of bankers don't know anything about it, you can perhaps appreciate that problem." he said.

DPers Some of Last Evacuees, Though Equipment Stays in 'Nam

(Continued from Page 1) were handled by the Vietnamese management and that the South Vietnamese government had taken over all of the joint-use sytems developed by the U.S. Agency for International Development (AID) and the Military Assistance Command, Vietnam.

"AlD's lease on its mainframe was transferred to the Vietnamese, and even the payroll for the American embassy was handled by this system," Rezendes noted.

Vietnamization in the computer area was perhaps one of the more successful aspects of the U.S.' campaign to ease itself from active involvement in that part of the world. Throughout 1971 and 1972, Americans worked to turn over to the Vietnamese the computerized elements of the country's armed services, as well as of the government's computer center.

U.S. money, equipment and advice were provided to a variety of Vietnamese services, including the country's air force, army, navy, Central Logistics Command and Joint General Staff; technical publications were translated from English to Vietnamese; and multilingual operating environments became prevalent in all the installations established [CW, Mar. 31, 1971].

Jointly funded by AID and the Government of South Vietnam, the GVN Computer Center made considerable progress developing land reform, import, public health logistics and veterans' benefits applications, according to Paul Collins, a systems analyst who served with AID as programmer supervisor at the GVN operation for five years. Seaca was contracted to assist in the completion of the Vietnamization of this particular computer system [CW, Nov. 29, 1972].

Computers, which first came into vogue

Computers, which first came into vogue in Saigon in 1974 when the Bureau of the Budget installed a 1401 tape system with the assistance of IBM France, were operating in 10 locations in Vietnam with additional installations planned by early 1972 [CW, Feb. 2, 1972].

When the war came to an end last Wednesday, Collins, who left Vietnam last November, said there were probably still some 10 to 12 installations operating in the country.

With the rapid pace of events last week, people, and not equipment, were leaving Vietnam. "It would be a safe bet to say all computer equipment was left behind," John Reilly of Indochina Relief, a branch of AID, said. "There was certainly no priority for removing any installation."

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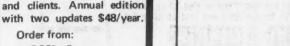
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Will Serve for One Year

DPer Picked to Modernize Federal Courts

PITTSBURGH, Pa. — A computer scientist at Carnegie-Mellon University here has been asked to serve for a year with the U.S. Supreme Court and the Federal Judicial Center to aid in modernizing the administration of the federal courts.

Selected in a nationwide competition, Jack R. Buchanan, 32, assistant professor in the Computer Science Department and Graduate School of Industrial Administration, was one of two persons named for the 1975-76 Judicial Fellows Program.

Buchanan was chosen by a commission headed by retired Associate Supreme Court Justice Tom C. Clark and will be on leave from the university during his stay in Washington, D.C., a Carnegie-Mellon spokesman said.

Responsible for research and development of computer systems which automate judicial administration, Buchanan will also serve as project manager within the Federal Judicial Center, the research and development arm of the courts, for two groups — one coordinating systems analysis of court procedures and the other designing and implementing system programs, the spokesman noted.

For the past two years, Buchanan has been a consultant for law firms on the acquisition and analysis of data in computer files to be used in hitigation and for the federal courts on the design of an automated accounting system for fund control, the spokesman stated.

A member of the Carnegie-Mellon faculty since 1972, Buchanan has served as a research assistant at The Artificial Intelligence Laboratory at Stanford University and as a consultant on computer research for IBM and the Education Management Center, which is administered through Carnegie-Mellon's School of Urban and Public Affairs.

After studying engineering at the College of Eastern Utah, Buchanan earned his B.S. and M.S. degrees in mathematics from the University of Utah and received his Ph.D. degree in computer science from Stanford in 1974.

Designed to attract young people who will make contributions "to judicial modernization" during and after their year as fellows, the Judicial Fellows Program began in 1973.

Four Judicial Fellows – all political scientists and two of them attorneys as well – have been selected for one-year terms, and a lawyer specializing in public personnel relations has held a special, short-term fellowship. The first two fellows are now employees at the Supreme Court.

The Judicial Fellow selected with

Buchanan is Paul R. Baier, assistant professor of law at Louisiana State University, the spokesman said.

Administered by the National Academy of Public Administration Foundation, the program is funded through grants from the American Bar Endowment, the Ford Foundation and the Edna McConnell Clark Foundation.

Fla. Legislature Pondering Bill On Voluntary State Certification

CLEARWATER, Fla. – DPers here could seek state certification if they want it under a bill backed by the Florida Society of Certified Data Processors (FSCDP).

The bill was introduced by Rep. John R. Forbes (D-Jacksonville). If passed, it would take effect in July.

Unlike the legislation the Society of Certified Data Processors (SCDP) sent to state governments, the FSCDP bill does not require mandatory licensing of consultants or other DPers, according to Harold L. Estes, FSCDP president. The SCDP and FSCDP are not affiliated, despite the similarity of their names.

Instead, the FSCDP bill resembles a plan New York Data Processing Management Association (DPMA) chapters are considering for their state [CW, April 9]. Both measures would set up state boards to grant certificates in data processing to qualified applicants.

Anticipate State Laws

While backers stress the voluntary nature of the two plans, both proposals anticipate that state law would eventually restrict certain DP tasks to certified peo-

"The need for this group of professionals to certify DP matters concerning privacy, security and public welfare will grow with the industry," the FSCDP stated.

"Future legislation controlling DP efforts concerning these and other areas will require these registered individuals to certify these functions."

The requirements for certification the FSCDP envisions resemble those of the SCDP and the New York DPMA.

The Florida group specifies graduation from an approved four-year course in DP plus one year of work experience. A person without the degree could qualify with five years of DP work.

In either case, the work experience would have to be "of a character to indicate the candidate is competent to be placed in responsible charge of such work."

The state board, appointed by the governor, could also require the candidate to pass an examination it designates. In all probability, this would be the Certificate in Data Processing (CDP) exam given by the Institute for Certification of Computer Professionals (ICCP), Estes said.

Polled DPen

Before drawing up its certification bill, the FSCDP mailed questionnaires to DPers and others around the state.

Eighty percent went to CDP holders, 15% to non-CDP holders working in DP and 5% to people doing other work.

Only 5% of the respondents urged the FSCDP to "forget licensing." In fact, 85% favored having a certified person participate in the design and review of systems that affected the public interest. A utility's billing software is an example, according to William L. Thomson, the FSCDP vice-president.

FSCDP vice-president.

DP auditors ought to be licensed, in the opinion of 70% of those surveyed. Fifteen percent were opposed to the idea.

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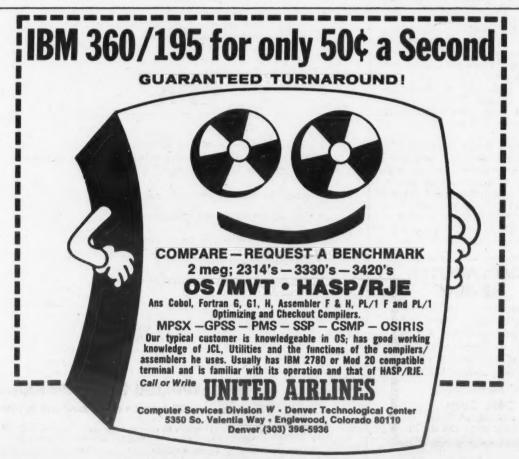
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CW Photo Feature By Vic Farmer

HANOVER, W. Germany - If there is any one computer show that can rival or even surpass the upcoming National Computer Conference (NCC), it surely is the yearly "Hannover Messe," or fair, held here recently.

Not only did all the German DP firms exhibit here, but most of the major American and other European firms joined to present their products for nine straight days to thousands of European DP people interspersed with a heavy sprinkling of students and engineers

This year, there were over 300 DP-related exhibitors; uniquely, the European software companies don't use booths, but instead rent small apartment-like bungalows built on the roof of the hall.

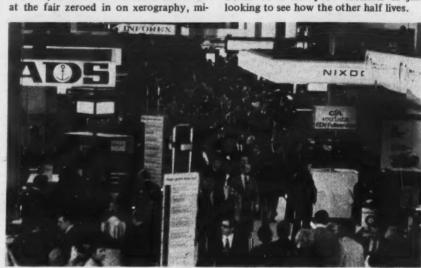
Unlike the NCC, the fair has no timeconsuming technical presentations, nor is it tied down by the goals and objectives of a committee of technical societies. Attendees have time to visit whom they wish, when they wish.

And for serious visitors, many of the booths were equipped with small bars and supplies of good German snack food. The atmosphere was friendly but business-

like, and exhibitors usually could explain their product in a number of languages. If a visitor got tired of data processing exhibits, simultaneous exhibits elsewhere

crographics, office furniture, metal-working and building construction gear.

The fair is an ideal stop for American DPers on a European vacation or just looking to see how the other half lives.



Located down this main aisle were IBM, Burroughs, ICL, Honeywell-Bull, Siemens, NCR, Nixdorf, Anker Data Systems, Singer, MDS, and Olympia. IBM had a 370/145 and three System/32s among its wares.



Wolfgang Bier, a Data General systems analyst, played music on the Eclipse paper tape reader using a 6K program. His program is free to Data General users and "covers five



With a large hall, the easiest way for a visitor to find just what companies he wanted to visit was through a computerized inquiry service that first called up lists of related exhibitors on a CRT, then printed out a hard copy on Siemens equipment.



Mohawk Data Sciences emphasized its 2300 key-to-disk sys-



Singer displayed its System Ten and terminals.



NCR, with one of the larger and more graphic exhibits, featured an 8200 system under the rotunda surrounded by its 299 and 399 business machines and its banking and supermarket terminals.

British Census Expected to Reopen Privacy Battle

By Joseph Hanlon

Special to Computerworld

LONDON — Britain is to have
a special midterm census in
1976, and it seems sure to provoke the same privacy battle as
the last census in 1971 — despite
the fact 20% of the announcement of the census was devoted

to privacy

The government again rejected proposals made after the last census by the British Computer Society (BCS) and Royal Statistical Society (RSS).

The two groups had been asked by the government "to review census security arrangements" in

danger and locates owners of vehicles in case of auto fire.

The department has also devel-

oped a preventive-maintenance

file of its equipment.

1971, and both were highly critical.

Both proposed independent monitoring of the census and independent reception of citizen complaints — which the government again rejected on the grounds it is still considering the Younger Committee report on privacy, published more than 2-1/2 years ago.

The announcement stressed computer security, noting that detailed criticisms made by the BCS have all been taken into account. As in previous censuses, the paper noted, "the names and addresses shown on the individ-

ual census form will not enter the computer."

Nevertheless, it will be possible to take a data entry from the computer and find out with which original form it is connected.

Just such a procedure is to be used for several follow-up surveys, probably the most controversial aspect of the census.

In addition to the normal name and address questions, the census will ask whether the respondent's toilet is inside or outside; whether he has a stove, hot water or a bathtub; and whether these facilities are shared with other people.

Included in the questions will be one about people away on census day, intended in part to gain "estimates of the number of one-parent families." Some argue "This is an example of questioning by stealth, for which the census has a liking. If a family is a one-parent family, they should be free to say so directly."

In addition, the census will ask about country of birth and country of parents' birth — a highly sensitive question in England where immigration is still a charged political topic.

File Helps Firemen Locate Invalids

By Ann Dooley
Of the CW Staff

KANSAS CITY, Mo. — Helping people out of burning buildings, especially those who cannot help themselves, is one of the most difficult jobs a fireman encounters. To make this task easier, the city fire department here is using a computer to locate invalids so they can remove them quickly from the scene.

An IBM 370/158 stores the addresses of nearly 400 invalids living in Kansas City. Whenever a fire is called in, a dispatcher checks whether an invalid lives at the address and, if so, receives his name, specific location in the building and a statement of his condition, according to Fire Chief John H. Waas.

"Firemen know immediately which room the disabled person is in," he said. "They don't waste precious minutes hunting through a smoke-filled building."

Belonging to the city, the 370/158 is being put to a number of other uses as well. The system stores a complete medical file on each of the nearly 900 firemen, for example.

If a fireman becomes ill or is injured on duty, his name is keyed into a 3270 CRT which displays blood type, allergies, personal physician, hospital preference and next-of-kin. This information is then relayed back to aid in treatment.

Because the department's two terminals are linked to the city's system, they have access to other departments such as the city real estate files, the water department and the Bureau of Motor Vehicles.

The information from these files helps in locating a building's owner, lists improvements to the property, familiarizes firemen with the structure before they enter, warns them of potential Lockheed System III

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Human - Not Computer - Failure Blamed

Swamped DP Centers Delay Unemployment Checks

By Catherine Arnst Of the CW Staff

PHOENIX – Soaring unemployment rates and inexperienced personnel were given as the reasons for the delay in issuing benefit checks in both Colorado and Arizona during February.

and Arizona during February.

Approximately 200 checks were stalled up to three weeks in Colorado while, in Arizona, 12,000 people may have waited up to four or five weeks for their unemployment payments.

Both states' DP centers acknowledged they've been swamped by the huge increase in claims that had to be processed this winter. In Arizona, the number of checks handled per day rose from 2,000 in July to over 13,000 in January, with an unemployment rate of over 9%.

Anna Zenkovich and Capitola Schalow of the Arizona Department of Economic Security (DES) said 250 to 300 new people with little or no experience were added to the DP center since November to handle the flood of claims. In addition, several benefit programs that went into effect in early January were unfamiliar to local unemployment office workers.

If a claim is filed with any errors, the computer, an IBM 360/40, automatically rejects it and the claim is sent back to a local office. Out of the 12,000 claims rejected, only 20% were true rejects, Zenkovich said. The others were either duplicates filed by local offices or had errors on the forms.

The problem was discovered toward the end of February; it took about 10 days to clear up the backlog. "Six people worked diligently on the stalled claims, including nights and weekends," Zenkovich said.

A master list of rejected claims was printed and then each one had to be reviewed separately to discover where the holdup was. "We never had this kind of workload before," Zenkovich said. "The public was very gracious about the whole thing, and we are now running back on schedule."

New Employees

Ronald Goodwin, Director of Information Systems for the Colorado Division of Employment, said their problems were also generated by the almost 150 new employees added to handle the 100% increase in continuing claims processed and 60% increase in new claims.

In addition, their program was revamped to accommodate new federal laws extending the number of weeks insurance is paid and making unemployment benefits available to job categories not eligible before.

Colorado's unemployment rate has a high fluctuation, peaking between January and March. However, Goodwin said they were not ready for so large an increase so quickly. Unemployment rates in the state went from 3.6% in September to 6.2% in February.

Problems in processing claims started occurring in mid-February, at the same time major modifications to the system were being installed. The systems department couldn't help out the new employees because they were already tied up with the new system, Goodwin said.

Not a Computer Failure

The 200 rejected checks were not due to a computer failure as the local media reported, he continued, but rather a problem in coordinating programmers and the new system. "Our strongest point is not systems analysis," he said. There was a misunderstanding of printouts when we put in the programs, and this caused the claims to be rejected."

"In our system, the computer (a Burroughs 3500) must pay checks consecutively and can't pay one until the proper authorization is inside. It won't pay checks out of sequence," he added.

Processing of claims got about eight or nine days behind. Three people were taken off their regular jobs to work exclusively on the holdup, which was straightened out by mid-March.

Many claimants in the state complained that their checks were held up longer than the three weeks officially given. One man even called the governor to complain that he was forced to a diet of peanut butter sandwiches because of the delay in receiving his checks. However, officials attributed holdups of over three weeks to other reasons such as an investigation of the claim.

Goodwin foresees more problems in the future as unemployment figures are projected to continue rising for two more years.

Credit File Holds Unusual Information

CLEVELAND — A lawyer who decided to check his file at a local credit bureau here was surprised to learn that as far as the credit bureau was concerned, he was married to his mother and working as a stock boy.

"I wasn't expecting any surprises when I filled out an application form to see my file," Richard Brudzynski said.

A hearing examiner for the state of Ohio, Brudzynski is cochairman of an American Civil Liberties Union committee investigating the impact of technological innovations on civil liberties.

After filling out the application to review his file, a clerk presented Brudzynski with a coded computer printout.

The clerk translated the code, which revealed Brudzynski was presently employed as a stock boy — "a job I had held six or seven years ago when I was still in high school," he said.

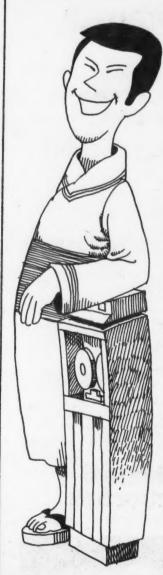
The next line indicated he was currently married.

"I was really surprised because I had just become engaged, but it was supposed to be a secret between my girl and myself. However, according to the credit record, I was married to Florence Brudzynski, who happens to be my mother," he said.

Credit bureau employees deduced that Brudzynski was married through a computer program used to eliminate duplicate addresses for junk mail.

Since Richard and Florence Brudzynski had the same last name and were living at the same address, "it assumed we had to be married," he said.

"I was seriously considering that, if they didn't correct the mistake, I would go to the domestic relations court and ask the judge for an annulment," he joked.



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Shukan Computer, Computerworld's sister publication in Japan, is a joint venture of Computerworld and the leading electronics publisher in Japan, Dempa Publications. Shukan is the only newsweekly for the computer community in Japan and with the combined resources of the two companies, it has the largest news gathering organization of its kind in the world.

Japanese businessmen read more than their American counterparts, and they place a greater value on the advertising they read. Buying decisions in Japan — unlike the common American system of one-man, "EDP Manager" control — are reached through development of consensus between several levels of operating management, including programmer and analyst levels. And Shukan goes to all these important buying influences. 23.5% of total circulation goes to Data Processing Management, 12.5% to Corporate Executives, and 27.9% goes to Professional Staff in the computer industry.

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Bankamericard Ends All Paper Exchanges Of Member Banks

SAN FRANCISCO - True to its word, National Bankamericard, Inc. (NBI) has eliminated all paper interchange among the processing facilities of its member banks linked to the nationwide Base II electronic draft data transmission system.

NBI promised a fully electronic interchange by March I when the system first began operation last November [CW, Nov. 13].

Now all 88 Bankamericard processing centers in the country, representing 270 card-issuing banks, are transmitting outgoing, in addition to receiving incoming, draft data on a computer-to-computer basis, a spokesman for NBI said.

Approximately 9.5 million interchange items accounting for \$226.9 million in Bankamericard transactions were processed through the system in March. The spokesman noted the electronic value exchange system has reduced float costs and said it has cut suspense accounts by as much as 80%.

Using Base II, processing centers no longer mail interchange sales draft paper. Instead, information from the paper is captured on magnetic tape and prepared for transmission by an NBI-supplied edit package.

Installed at seven regional processing centers, 24K Digital Equipment Corp. PDP-11/10s serve as tape transmission units, he explained. These minicomputers transmit and receive batched data over dial-up out-Wats telephone lines via a 768K IBM 370/145 at NBI's central facility in San Mateo near here.

Paper is stored at merchant bank processing centers and can be retrieved if a cardholder requests a copy of an original document, the spokesman said. Eventually, Base II will have the capability for the card-issuing bank to request and the merchant bank to confirm the mailing of such documents, he added.

The system provides services beyond draft data transmission, including the transmission of daily reconciliation registers to accommodate net settlements, the handling of chargebacks and reversal items and the transmission of authorizations performed by NBI's Base I authorization system on behalf of member

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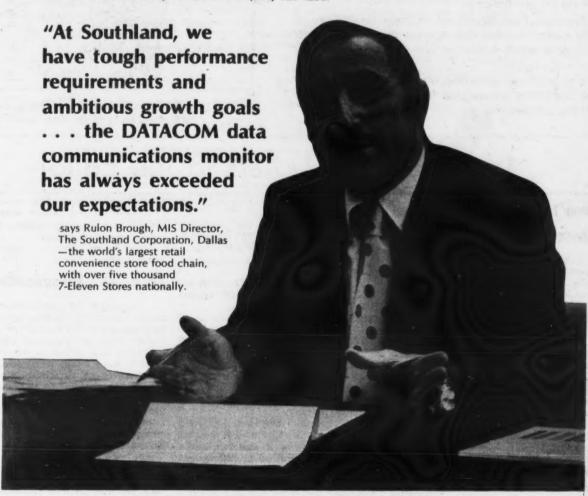
LONG BEACH, Calif. - The 1975 edition of the IEEE Computer Society Publications Catalog, covering over 80 computer technology books, is now available.

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"We generally shy away from software houses, but with DATACOM we're glad we made an exception," he continues. "The efficiency of the DATACOM monitor has more than paid its cost—a competitive monitor would require twice the computer resources we're now using. What's more, from the day it was installed, we've been able to add application after application with ease. And with DATACOM, the transition from DOS to OS was smooth. "With over 250 terminals handling 640,000 messages per day, we can't afford

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Editorial

Time for Action

There seems to be some foot dragging on the part of the White House in naming members to two commissions whose work could vitally affect members of the computer community.

The White House has so far failed to name the membership of the National Commission on Electronic Funds Transfers, although that body was established early last November.

At the same time, the White House has also failed to appoint the three commissioners it is required to name to the Privacy Protection Study Commission, which was established in December with the passage of the Privacy Act of 1974.

President Ford should act on these nominations at the earliest possible date because the work of both groups is vitally important and should be started as soon as possible.

But he should remember that DP expertise should be one of the prerequisites for some of the members of the commissions.



"... Still a Bug or Two, Chief — Somehow the Program Mailed Out "Sixteen Ways to Promote Arab Trade" to the Oil State Senators."

Letters to the Editor

Don't Overlook Singer Ten Because of Just One Suit

As a result of the article, "Former User Sues Singer; Claims Software 'Fraud'" [CW, April 2], the accompanying ad and ensuing letters, one might get the idea Singer is the only vendor being sued these days.

Lest the wrong impression be left with your readers, we are one of many successful Singer System Ten installations and have had our system for over 2-1/2 years.

We have gone through two expansions in our system which involved a half-hour equipment hookup and no programming changes. Thanks to an uncomplicated partition concept, we enjoy such advanced features as multiprocessing six jobs at the same time and still get 1,600 char./sec response time on our CRTs. Try that on your IBM System/3.

Alvin Alosi President

Data Enterprises Canton, Mass.

IBM No Insurance Policy

I would like to submit this as one possible answer to G.H. Barger's, statement "How any small user can consider any system other than an IBM System/3..."

As the manager of a small installation, I was concerned with the following areas when looking for the proper system to install in our organization: cost of equipment, ease of programming, ease of operations, physical installation characteristics and growth potential. Management wanted a system where the information stored in it would be up-to-date and available upon request.

When designing the system and laying out the specifications, I determined that an on-line, cardless, multitask system using CRTs as I/O devices was required.

When the system search was begun in May 1972, there were only a few computer manufacturers offering this type of a system — but not IBM. It was not until the middle of 1974, when IBM announced the System/3 Model 8, that the company offered this capability.

Would the System/3 be available today if it weren't for non-IBM users who were willing to pioneer a new concept and take the change? The three magic letters "IBM" on a piece of equipment aren't insurance against system failure. How

many System/3s are being replaced with non-IBM equipment today?

I am a Singer System Ten user. I am happy I switched and I won't come back until IBM realizes there are still people in the world who believe in the simpler things in life.

Thomas Michel DP Manager

E.W. Ferry Screw Products, Inc. Cleveland, Ohio

Successes Newsworthy, Too

G.H. Barger's comment, "How any small user can consider any system other than an IBM System/3 is beyond me," did an incredible disservice to the minicomputer industry.

For every horror story relating to implementation problems of an IBM competitor, there must be at least one similar installation problem of an IBM system. Unfortunately, only exceptional disasters are most newsworthy — how about the successes?

Successes?

Our company has been using a Singer System Ten for two years. With nearly a minimum configuration, we run seven independent application systems on-line at all times.

The System/3 could not match our versatility, storage capacity or output speeds with a system that cost double our costs. IBM does not have a monopoly on good hardware or good software — as thousands of satisfied non-IBM mini users can testify.

Edwin Levy

Majestic Penn State, Inc. Philadelphia, Pa.

Keep Applications Clean

Barger, turn in your coding sheets, your templates and your Pentel pencil, immediately return to your employer at least 50% of your salary, then go forth and open a fast-foods franchise.

"Vendor percentage of success" — what has that got to do with good systems design? It's a bloody cop-out used by weak-kneed "me-tooers" when their lousy systems don't work.

If it weren't for people like Barger, there would be no talk of breaking up IBM since more of us would have tried other vendors, resulting in a more even distribution of the DP market. If that happened, we could all have the "hand holding" that only IBM can afford to give us now.

Bargers of the world, get your minds off

hardware and on applications. There's not a hardware vendor in the world that doesn't have a usable machine if your application system is clean.

R.W. Potter

Summersville, W. Va.

Term 'VS' Misunderstood ...

In the March 26 Special Report, the article entitled "Rethinking Application Programs Key to VS Success" by John J. Hunter contained numerous misleading statements and arrived at what, in my opinion, was a totally wrong conclusion.

Hunter seemed to misunderstand the purpose of virtual storage. He misused the term "virtual storage," applying it to the page data set, whereas virtual storage is actually a set of fictitious addresses which correspond to DASD locations on the page data set.

Thus pages do not move back and forth between virtual and real storage; rather, pages within virtual storage may move back and forth between real storage and the page data set. The primary advantage of a VS system is more efficient use of available and real storage.

Hunter's statement that the system "may perform as many as 19 additional operations each time an instruction is executed" could be very misleading to non-VS users. The hardware operations involving the DAT facility increase instruction execution time by only a small percentage, and the operating system's paging operations have to be performed for a very small percentage of instructions, even in an overloaded system.

Hunter's implication that I/O-bound shops would be especially degraded by VS is dead wrong; in fact, studies published in Computerworld have shown I/O-bound shops almost invariable experience an improvement in throughput with VS and that it is the CPU-bound shops that experience degradation.

This is all related to the main advantage of VS, namely, improved utilization of real storage through multiprogramming, which is valuable primarily to the I/O-bound user because he has plenty of available CPU time which the extra partitions can utilize.

Hunter stated that rewriting application programs "is the soundest and, in the long run, the least expensive solution available" when an installation incurs problems with thrashing. While this may be true when only one or two programs need rewriting, it is not true if many programs need to be rewritten, especially

when the programs that could most advantageously be rewritten are the largest, most complicated, most difficult programs to rewrite.

Programmers are very expensive these days, while real storage is becoming cheaper and cheaper. Hunter seemed to underrate the amount of improvement that can be expected when increasing the size of real storage.

To begin with, an increase from 96K to 128K actually represents an increase of more than 30% in the amount of available real storage; for example, let's suppose an installation with a 370/125 is running a 44K Supervisor and 24K Power. In that case such an increase in memory size represents an increase from 28K to 60K, or 114%, in the amount of available real storage.

Furthermore, tests we have run indicate most programs seem to require a certain minimum amount of real storage to run efficiently. Given that amount of real storage, they will run with very little paging activity; given just 10% less, they will require twice as much time to run; given still less real storage, they will slow practically to a standstill.

Charles R. Gies
Senior System Programmer
Combined Insurance Co. of America
Chicago, Ill.

... But Not in This Context

My article was directed towards the problems of large OS systems. Charles R. Gies' comments reflect his experience with a rather small DOS/VS installation and therefore cannot be pontificated to VS in general.

His statement that adding more core will reduce paging carried a terribly familiar ring. Of course, if you have the money to add enough core you can set V=R and the paging problem will vanish altogether, right Gies?

Gies missed the boat with his comment concerning instruction timing. He interpreted it as address translation operations (DAT box); I was talking about I/O overhead (IOS).

Incidentally, Gies, I'm well aware of the page data set. I omitted it in the article because I was discussing the theoretical principles of virtual storage. I don't feel the introduction of a new term would have added anything.

John J. Hunter Project Editor

Auerbach Publishers, Inc. Pennsauken, N.J.

O

Letters to the Editor

ACM Not Threatened; IEEE Complementary

Relax, Grosch, those engineers aren't gonna getcha ["The Ware of Transgressors Is Hard," CW, April 23]. The IEEE Computer Society people are interested in applying, and the Association for Computing Machinery (ACM) in discovering.

Those computer programming engineers are as much of a threat to the ACM crowd as the Westinghouse and GE nuclear reactor engineers are to the Los Alamos physicists. The world needs both: one to probe, discover, make false starts and develop theories; the other to implement and complete (with emphasis on budget, specs and performance). Who knows, in the best of your possible worlds, IBM may continue to use nonengineers as programmers, piling layer upon obscene layer of software upon OS until it collapses.

All while a Burroughs or Univac hires programming engineers and end runs the Giant. Charles T. Casale

Wayland, Mass.

IEEE More Relevant

The rantings of CW's toothless old man of an editorial director are beginning to take on the character of deathbed croaks. As a member of the ACM power structure, Herb Grosch's posi-tion regarding the IEEE Computer Society could hardly be

considered startling.

However, review the kinds of names that appear in Grosch's column. Is it perhaps coincidence that so many respected individuals have found IEEE a more hospitable environment than ACM?

No, they are merely part of the large number of people tired of ACM's ignorance of the real problems who are gravitating to a more relevant organization.

Please let ACM continue to be an academically oriented institution with disdain for practical problems. Then the publish-orperish crew will have a place to put their stuff; at least it'll keep it out of the much more worthwhile IEEE periodicals.

Reston, Va.

Bank System Old Hat

Jerry L. Ogdin

Regarding the article, "Bank's On-line System Holds Interest for Clients" [CW, Nov. 6], it caught my attention that you publish such a story with bells and whistles. The Venezuelan banks have been operating the on-line cashier terminals with the same applications for about six years.

Around 50% of the banks in Caracas have nationwide teller terminals, all linked to computers of much smaller size (64K to 128K) than you announced. Where is the big news?

Dr. Pedro Pablo Puky H. Banco Nacionale de Vescuento Caracas, Venezuela

Beyond 1984, Indeed

There's a letter in the current Datamation so wrong-headed, and so weakly answered, that I can't bear to let it slip into the oblivion it so richly deserves. One Stephen Wright of Applied Data Research, Princeton, writes, "Surely 1984 should see at least the beginning of the end of stored-program computers. Self-modifying programs are known to be harmful . . . Mixing of programs and data leads to abominations like VS . . .

He was writing about a very good predictive article by Ted Withington, and the comment appended by the latter was so wishy-washy as to be almost as incredible as the letter itself.

If there is one idea beyond the original Babbage dream of the computer that is central, that is absolutely valuable and powerful, that is certain to be perpetuated as long as data is processed and models are built and our messy human culture is operated, it is the stored-program concept. To envisage, let alone approve of, a computer future without it is like thinking of education without writing or printing or of communication without voice links.

What Wright is telling us is that he and his overweening peers are now so clever, so farsighted that they can prescribe character sets and codes, data structures, operation sets, storage hierarchies and the details of application programs for the entire future, world without end, amen!

I've been in this nutty racket and its preelectronic forerunner for almost 40 years, and I find its pluralism, its incredible variety, its twists and turns so challenging and so unexpected that I can only see into tommorrow by relying on the eternal verities: pride, greed, the lust for power - and, of course, stupidity. Ever since the hardware boys began to string tubes and resistors together, there have been software insolents who dreamed of remodeling the machines. They range from the simple souls who want everybody to work in APL, or advocate business data processing in Algol, to the mercenaries who are making it possible for manufacturers like Burroughs to seal off their bit-manipulating power from the users and make higher level languages compulsory

We absolutely must retain access to the fundmental power of the computer. That means no locked-on integument of wasteful software, whether language or operating system. That means retaining the possibility of programming in machine language. That means insisting on all the options. And that means not denigrating, but glorifying, in the stored-program idea.



Gates' Method Best So Far

Real-World Test Needs 'Suspect Information' Check

The Gates method of testing file-update programs, discussed on page 12 of this issue, is a major advance over any other method to date.

Gates recognizes the real-world function of programs, which is both to positively update data files when properly instructed to do so and also to protect the

integrity of the data files from the normal stresses and strains of improper instructions, faulty logic, unusual circumstances, etc.

The fact that the Gates method assumes, as a given, the dangers of normal error and does not let a file-update program be considered operational

Alan Taylor, CDP

The Taylor

Report

until this has been dealt with is new and perhaps explains the number of test groupings he expects to be passed before a program is accepted.

Working in the real world still, he apparently expects that programmer desk checking and assurances are not sufficient to really define the operation of a program and so asks for actual examples of input passing all the test groups to be provided as a part of the test procedure.

Yet, while new, major and good, I don't think Gates is really yet in the real world, although he is well on the way. The real world does something and needs something his testing methods could provide but currently don't provide.

The methods currently deal only with "correct" and "incorrect" information. The real world also deals with "suspect" information - and, until programs deal with suspect information, they will not really be out of the experimental stage.

In the Gates method, data fields brought in by an update transaction are checked for consistency with the information already on the record. The standard type of check here is that maternity leave is not to be issued to a person whose sex is recorded as male.

This is a nice simple one, but the relationships involved can be quite hairy, so the checks are not simple to program without a decision-table type of language. However, this same type of check could also flush out items which, while not necessarily wrong, are in some way suspect. The updating of the record for Mary Ann Salton, which left her living in nonexistent Salton St. in Cambridge, Mass. [CW, April 23] is a typical example

of this type of operation. It is possible two fields in a name and address grouping are really the same but it is also an indication of a much higher error probability than exists in normal address updatings. Moreover, it is something which can be checked upon. Why, I wonder, does Gates apparently not think this check is just as important to maintaining the integrity of his files as

any of the other tests? One of the reasons this type of test is not taking place is that it involves a basic change in the handling of input and perhaps in the record formats both of the

file and of the input itself. These changes are indicated in the box. Checking out suspicious fields involves the input design because there are now two levels of input needed - not just one. There is the input of the original information such as the fact that Salton now lives on Salton St. Then there is the input of the confirming or canceling information - that she really does or does not live on Salton St.

The file record, in the meantime, has to accommodate the new factor that some doubt as to its validity exists. The minimum situation will be a "record under question" flag, and this problem naturally starts backing up whenever a later transaction touches against the file. In fact, a whole new need for putting action off or dealing with it in some way in which later versions of it can be used is needed.

This is simply not yet recognized as being a part of the real-world situation.

The Gates method of testing, if expanded to test for suspicious characters, would soon get the user to define what

actions he wanted to take place in various circumstances, and then adapting the programs involved would not be difficult, any more than the testing of them would

Hopefully, now that he has opened the way into the real world, Gates and others will think about these problems and lead us into techniques that can accomplish all

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How Suspicious Characters Can Change Design

Input

A new input field is needed which acknowledges that a "suspicious character" report has been received, reviewed and that the action originally instructed to take place is either confirmed or rejected.

File Contents

A new file field or fields which note that the accuracy of the current contents of the file is under investigation. It may include details of investigation date, handling of transaction during the investigation; etc.

Processing paths for transactions referencing files which are potentially in error must be provided in the standard day-to-day operations.

Where appropriate, processing paths which undo all transaction operations resulting from the use of incorrect data (which may have been on the file incorrectly for some time before being spotted) will have to be provided.

Output

Output of suspicious character reports, replacement output of previously issued incorrect output and output of "action pending on this transaction until investigation is completed" reports will be necessary.

The problems involved in handling a "suspicious character" report are not simple but, in fact, impact most of the operations of a computerized system.

Five Groups Deal With Real-World Situations

Test Series Ensures Functionally Correct Programs

By R.D. Gates

Special to Computerworld

Before a newly written program can be considered functionally correct, it has to be tested adequately.

In my experience, adequate testing involves more than simply dealing with record additions and deletions, although these must be dealt with thoroughly. Adequate testing also involves dealing with real-world input situations, testing out the system logic on multiple updates,

Systematizing testing programs for functional correctness can be divided into five major groupings, working from the simple to the complex.

The programmer should produce actual examples of correctly working tests for all aspects of each group before proceeding to the next.

The first group involves record additions. The tests involve whether records are added correctly and whether records

which should be are added.

To test whether a record that has been added has been added correctly, tests should be made to see that:

· All input fields have been edited (i.e., tested according to the internal field characteristics - alpha only in alpha fields,

• The supplied input matches the requirements of the file being updated. This I call "validation" and involves making checks against other available material,

sometimes within the current file, but often outside it, such as verifying that input account numbers exist in a master account field.

 All fields not defined by provided input are set to their correct initialized

• Where the presence of one field re-

"master" record does not exist?

Similar complexity exists in setting up the tests for record deletion and record modification. There is not space here to deal with these in detail, although they do comprise essential elements of the testing process.

The last two groups deal with the

specific application requirements is needed to check out what happens in this and other similar areas - details of which should be found in the program specifica-

A change acceptable when a nonzero balance is included in the record may not be acceptable when the balance is zero. Codes included in records may also impact the decision to accept a change or not to do so.

Tests are, therefore, needed to see that records are not updated when the data currently in the record indicates no such update should be accepted.

Gates is a project manager with McDonald Douglas Automation Co., Long Beach, Calif.

Contributions to "Professional Practices" are invited and should be addressed to Alan Taylor, Professional Practices, Computerworld, 797 Washington St., Newton, Mass. 02160.

Professional Practices

quires that other fields be present, all necessary fields are present (inclusive set

• Where the presence of one field forbids the presence of others, updates are rejected if forbidden combinations occur (exclusive set test).

Whether the records are added when they should be involves six tests:

• Can records be added before the first record on the file?

• Can they be added between existing records? • Can they be added after the last

record? · Can they be added to a file with no

existing records? · Are records rejected if duplicate records already exist either on the file or in

the input data? Are records rejected if they are "dependent" records when its "superior" or system logic requirements and the current data requirements.

The particular system involved will normally have specific requirements of its own. For instance, it may permit a record to be added and then modified within the same update cycle. Alternatively, this may be forbidden by the application

Testing that the system is following the



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Page 13 May 7, 1975 Computerworld SOFTWARE&SERVICES

'Gemini' Builds Edos-Based Multiprocessor Systems

Of the CW Staff

How much do you pay for a software package that allows you to avoid an upgrade from an IBM 360/50 to a 65, that allows you to consolidate two centers - one with the 50, the other with a 360/30 - into one multiprocessor center and that allows you to see a 20% to 25%

throughput improvement?
"We pay \$175/mo," according to R.W. Carlile, president of Global Data Corp. in Anaheim, Calif., where the Gemini feature of Extended DOS (Edos) from the Computer Software Co. has been in operation since November and the results have been those noted above.

Global is a batch-oriented operation, but the use of Gemini in a developing teleprocessing shop appears equally promising. James Fisher, MIS manager at Taylor Forge Division of Energy Products Group, Gulf and Western, based in Cicero, Ill., has logged a 27% throughput gain by linking a 360/40 with a 30 and putting all the I/O and teleprocessing functions on the 30.

Edos itself is a series of coordinated and integrated system software enhancements designed to improve the performance and operational characteristics of the 360 and 370. Available since 1972, the basic Edos has been extended several times, generally with full-blown product announcements.

But Gemini was different. Designed to allow two 360 or 370 CPUs to work together with shared peripherals and one of the processors in a support role to the other, this feature has been completed since September and the software vendor has been quietly installing it without any general public announcement.

Devoted Edos User

Global handles the DP work for Global Van Lines throughout the world and is a service bureau for "40 or 50 other accounts." A devoted Edos user before Gemini, the firm has a 360/50 that was loaded last fall and it seemed likely it would go to a 65.

Instead, it was able to move a 96K 360/30 it already owned about 20 miles from a subcenter, lash it to the 384K 50 and share 14 Model 2314 disk drives, six tape drives and two printers. Work previously done on the 30 was brought into the main center and absorbed easily by the multiprocessor operation, Carlile said.

With the combination of Edos, Gemini and the Extended Spooling Facility (another Edos feature) all in place, "we feel we have an OS/MFT system without all the headaches of OS."

He was especially appreciative of the way the Gemini-driven system splits operator messages, putting tape and diskrelated information on the 50 console, and forms change and other low-speed I/O messages on the 30. Global had two operators anyway, just for the 50, so this separation of message types has eased their work "considerably," he said.

Contradictory Pressures

Fisher's implementation of Gemini at Taylor Forge was predicated on two seemingly contradictory pressures. The group wanted to set up a teleprocessing net to ultimately link 22 plants, but 250 hours of 1401 work each month meant the shop had to keep its 40 (with compatibility mode) rather than moving up to a

First step in the teleprocessing operation is to link locations in Lenapee and Allentown, Pa., and in Ackerman, Miss., with Cicero. By the middle of this month, Fisher expects to have IBM 3780s in the Pennsylvania sites, operating through a Bell 209 data set in Lenapee, and a Datapoint 1100 in Mississippi, all feeding into a newly acquired 360/30 in Cicero.

Allentown had been doing its work on a 40 with four disk drives and that will go. The Mississippi operations had a teletypewriter-Friden Flexowriter/compuwriter link to Cicero, but Singer will no longer

support it so it's going too. And, with the Datapoint, equipment costs will drop from \$1,100/mo to "something like \$600," Fisher noted.

The Cicero installation now has a 256K 40 with 18 Model 2314 disk spindles and a two-channel switch for sharing and 6 tape drives. The Model 30 has two card readers and a 1403 N1 printer as well as linkage to a 3704 communications controller.

The time saved in the 27% throughput improvement realized by putting I/O on the 30 will be used to handle "about 250 hours of work per month from Allentown and 75 to 125 hours per month from Lenapee, as they develop their systems, Fisher said.

'Dostovs' Eases Conversion Job

WHITE PLAINS, N.Y. - As much as 95% of the effort needed to change a workload from DOS to OS/VS can be handled in one-third the time needed to do the work manually with the DOS to OS/VS (Dostovs) conversion system now available from IBM, the vendor said.

An Installed User Program (IUP) developed by Envirotech Corp., Salt Lake City, Dostovs converts Job Control Language (JCL) procedures, Cobol and RPG (but not RPG-II) source programs and Sort/Merge control parameters.

The conversion capabilities include production of JCL needed for recompilation and program testing as well as up to 90% of JCL needed to execute the user program once it is converted to the new environment. References to DOS utilities, Indexed Sequential (Isam) files and JCLinitiated Sort operations are all changed under Dostovs control.

The Cobol conversion routines handle ANS Cobol, Cobol F and Cobol D source statements, though Cobol D has to be passed through IBM's Cobol Language Conversion Program first. Output is in either OS ANS Cobol Version 4 or in OS/VS Cobol, IBM said.

The Sort/Merge support converts 100% of the control cards for DOS Sorts 483 or 5743-SM1 to comparable cards for OS Sort/Merges 5743-SM1 or 5740-SM1, a spokesman claimed.

Output from Dostovs includes side-byside listings of the DOS and OS JCL, Cobol or RPG source statements or Sort/ Merge control cards. All the listings are annotated to alert programmers to areas requiring additional code.

The conversion program is written in ANS Cobol Version 4 and can be used on 370s - models 135 through 168 - under OS/MFT or MVT or OS/VS1 or VS2. Dostovs carries a one-time charge of \$3,665.

Directory Shows Capabilities, Sites of Mini Software Houses

RIVERSIDE, Conn. - The first edition of the Minicomputer Software Directory, published by Minicomputer Data Services, contains write-ups on 42 suppliers with more than 400 services and 200 application programs listed.

Currently, it does not contain detailed descriptions or analyses of the packages or services offered, but does some qualifying of vendors before they are listed. To be cataloged, each vendor is required to provide three customer references to the publisher and pay for a subscription to the directory itself.

Those two requirements are intended to encourage listings from suppliers that have a record of high-quality services and are reasonably stable financially, the publisher explained.

Eighteen of the first 42 suppliers have less than 10 employees each. Though the publisher admitted staff size is "an indicator of the resources available to the user, it then hedged, noting "the user must balance quantity with quality, availability, commitment to your project, etc."

The directory shows, by application, the services offered by each supplier, breaking these into application packages, consulting work, contract programming and hardware/software turnkey systems. The minis on which each supplier has had experience are also listed, but the specific CPUs on which the packages work are not

Perhaps one of the handiest parts of the directory for the small user is a crossreference which indexes the suppliers by city within state or, for the international vendors, by city within country. Another cross-reference lists supplier by the CPUs on which it has had experience.

The directory is available for an annual subscription rate of \$45 which includes two updates. Minicomputer Data Services is at 20 Coventry Lane, 06878.

Really `Aplum' for CDC Users

AMHERST, Mass. - The University of Massachusetts (U.Mass) is making available an advanced APL system (Aplum) for installations running under Kronos 2.1 on Control Data Corp. CDC 6000 or Cyber equipment. One of the goals of the free distribution is to encourage feedback and a sharing of programs developed under the system, a university source noted.

Aplum was developed in the past year when the university switched from a CDC 3600 running under the U.Mass. time-sharing system and the previously developed U.Mass.-APL to the CDC Kronos system. The work was supported in part by a grant from CDC, the university acknowledged.

Aplum incorporates the features of U.Mass-APL, including error trapping, Execute mode, formatting and a file system. The new APL system contains the concepts and capabilities of shared system variables and functions com-

parable to IBM's APL-SV coding. All command and function definition-level capabilities are available to a user program while it is executing.

With dynamic memory allocation a part of the Kronos environment, APL users are able to use any size workspace, a spokesman added.

The current interpreter portion of Aplum requires a CDC 6000 or Cyber mainframe with at least 50K octal words of memory to function "comfortably."

Any interested organization can have the source listings and code for Aplum without charge but must sign a nondisclosure license. A reference manual, written by Clark A. Wiedmann, is also available from the university for \$2.50/copy.

Requests should be addressed to APL Group, University Computer Center, GRC, University of Massachusetts,

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Sycor 340 Now More Intelligent

ANN ARBOR, Mich. — Users of Sycor, Inc.'s Model 340 batch terminal can expect better communications support, a sort program, a blocking utility and Ebcdic diskette compatibility with an enhanced flexible disk software package just released by the vendor.

The communications support built into the Level C release includes compatibility with IBM's 2770 and 3780 terminals and terminal-to-terminal links with other Sycor 340s. When linked together, one 340 may operate in attended or unattended mode or serve a master station terminal to poll the other cassette-based or diskette-based units.

The sort program included in this release permits the user to sort data files or create index files for use with Sycor's Terminal Application Language (TAL) indexed access instructions, as well as creating multiple indexes to the same base files.

The blocking utility is designed to

combine multiple small, logical records already recorded on cassette, magnetic tape or diskette into larger, physical records.

Support for blocking on diskette also allows indexed access to the records with the sort program and the TAL instructions, a spokesman added.

To provide compatibility with IBM 3741, 3747 and 3540 devices, Sycor provides the capability to copy its own Ascii files to Ebcdic diskettes which are IBM-compatible. The reverse capability is also included in the Level C package, Sycor noted.

The communications software supports IBM and Sycor compression techniques, buffers up to 512 characters long and record blocking within each buffer.

each buffer.
The complete software release, including two diskettes, costs \$50; a single diskette version, with the communications support, costs \$35, the spokesman said from 100 Phoenix Drive, 48104.

With Itel Help

360s Gain Eight DOS Partitions

SAN FRANCISCO - DOS/VS users operating under IBM's DOS Release 30 can have eight partitions, instead of the five supported by IBM, by utilizing control software modifications now available from Itel Corp.

The DOS changes provide three additional foreground partitions (F6, F7 and F8) with no changes in background processing support normally provided by IBM. Power/VS, IBM's spooler routine that stores print/punch output temporarily on disk, has been modified to work with the additional partitions, Itel noted.

The modified software can be used on any 370 under DOS/VS, but main memory limitations of the Models 115 and 125 seem to make it inappropriate for those environments.

Users with 135s and especially 145s probably can make the best use of the newly available partitions, the company said.

Although the package that is now available "off-the-shelf" is designed as an upgrade of IBM's DOS Release 30, it can be modified by Itel – on 60 days notice – to work with DOS/VS Release 31 which has just been released by IBM, Itel added.

The software is currently available only to users who are "hardware" customers of Itel, but the hardware involved need not be a computer. Users who have acquired tapes or disk units, but not a complete system, can still qualify for the DOS/VS upgrade, the spokesman said.

Marketed under a separate contract from any others the user has with Itel, the software leases for \$400/mo to \$600/mo depending on the time period covered.

Itel is at One Embarcadero Center, 94111.

PDP-11 Basic Users Offered Debug Tool

NEW YORK — Users of Digital Equipment Corp. PDP-11s under RSTS or RSTS/E can resolve Basic program problems quickly with the Dependable Debugging Tool package from Innovative Systems Associates (ISA).

This software supports the user in various ways, the vendor said. With a BREAK command, it can halt execution on a specified line of code and then, under control of a VALUE command, show the current value of specified variables.

A LIST instruction produces a list of statements, apparently from any place within the program specified by the user.

The TRACE command prints, in sequence, each line number before it is executed, while SCAN permits searching through a program to find all occurrences of a particular variable, string or statement.

UNDO breaks up multiple line statements for analysis and use by the TRACE command. Users confused about how to attack their problems can start with a HELP command, which displays all of the debugging package's patients. ISA noted

debugging package's options, ISA noted. The package can be used for Basic or Basic-Plus operations under RSTS or RSTS/E. It fits into 8K of memory.

User-installable, the debugging package is available now for a one-time charge of \$225 which includes instruction manual, sample runs and vendor support for the first 60 days of use.

ISA is at 507 Fifth Ave., 10017.

CMS Command Use Reported by 'PMF'

NEW YORK - The Product Measurement Facility (PMF) package from Standard Data Corp. provides VM/370 users a method of capturing and analyzing Conversational Monitor System (CMS) command usage throughout the CPU.

PMF measures use of EXECs as well as program modules, the vendor said.

Statistics accumulated during execution of a CMS command – including connect time, CPU usage and I/O counts – are supplied to a data reduction subsystem to produce management reports. Usage by user identification number as well as by command is shown, as is a summary of average system resource utilization for each monitored CMS command.

Data collected by PMF is logged to a virtual minidisk allocated to a unique user identification number. Monitoring is continuous but collection of the data is controlled through Logon or Logoff of the unique User-ID, Standard noted.

The range of CMS commands to be monitored is also user-controlled.

PMF can be acquired for a one-time cost

of \$4,800, but a lease plan is also available, a Standard spokesman noted from 1540 Broadway, 10036.



'VIP-III' Accesses Vsam Logic, Skips IBM Approach Overhead

LONDON, Ontario - The benefits of IBM's Virtual Storage Access Method (Vsam) are available to Cobol-, Assemblerand PL/I-oriented 370 installations at sharply reduced costs with the Vsam Interface Program (VIP-III) from Logicom Corp., a vendor spokesman said.

The package cuts both the time and the memory normally required for Vsam operations by communicating directly with the Vsam control blocks instead of working through a series of intermediate Vsam subroutines. These routines take nearly 9K bytes of memory; VIP-III takes only 2K, Logicom noted.

Accessed by standard CALLs from the user program, VIP-III is said to support key-sequenced (indexed) and entry-sequenced file organizations. Security through verification of passwords is also provided, the company said.

Trying to show VIP-III operations in the light of an access method users know better than Vsam, the vendor claimed, "depending on the individual configuration, available storage and Vsam performance options selected, the user can expect

Data Check Bypass **Gains Flexibility**

ENCINO, Calif. - An updated version of the Data Exception Bypass Routine from Joseph Sider and Associates, JSCAPDX now handles a broader range of instructions to help programmers get faster debugging. An execution-time option allows the user to turn the bypass off so the application program will be halted in case of a problem.

Sider's routine operates in much the same way as other data exception bypasses. Instead of allowing an invalid data field to cause a program abort, it registers the location of the problem instruction, then zeroes the field and reexecutes or bypasses the instruction.

With this approach, program tests may continue despite relatively minor problems, and the user gets an overview of how well the basic logic of the program functions, instead of crashing on the first

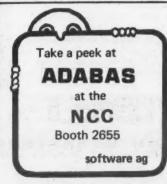
The programming aid can handle data exceptions triggered by any IBM 360 or 370 instruction.

While permitting minor problems to be passed over may be acceptable in a test environment - as long as the locations are marked for later cleanup - such a casual approach may be unacceptable in production mode. Therefore, Sider's routine permits the operations management to turn the bypass on or off at execution

Under DOS, the switch is controlled by an Upsi bit setting. The OS version allows the program to pass a PARM parameter to activate the data exception captures and provides the option of printing the exceptions either separately or interspersed with regular output.

The object module of the new version of JCSAPDX can be acquired for \$200 (DOS) or \$300 (OS).

Source code is also available for \$500 (DOS) and \$600 (OS), Sider noted from 15713 Varden St., 91436.



an improvement in processing time relative to Isam ranging from 1.7 to 2.5 to 1 when using VS Assembler.'

Sequential and direct-access operations under Cobol can by dynamically intermixed under VIP-III. Normal Cobol/VS options require a file to be closed and then reopened when the processing mode is changed; under Vsam, this again requires the loading and execution of "relatively lengthy" control routines.

In addition, variable-length records are supported and, on key-sequenced files only, the length of a record to be rewritten may be changed. A record of any length can be inserted in a key-sequenced (indexed) file, Logicom added. Running under DOS/VS, QS/VS1 or

VS2, the VIP-III package is available for a one-time charge of \$1,800 or \$64/mo under license.

Logicom is at 127 Albert St., N6A 1L9.

DATA BASE SYSTEMS: A PRACTICAL REFERENCE by IAN R. PALMER: Data Base Consultant, Member CODASYL Committee. Edited by Robert M. Curtice, Staff Member, Arthur D. Little, Inc.

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Chicago - Jun. 2-3 Orlando - Jul. 2-3

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Advanced Teleprocessing Systems Analysis and Design

This course is a follow-up to Course #1010, with special emphasis on problem solving techniques for minimizing operating costs in commercial data communications networks. Also led by Dr. Dixon Doll, the course covers procedures, approaches and algorithms for evaluating and cost-optimizing network organizations.

This seminar runs three days, and total cost, including an extensive set of customized course materials, luncheons and continental breakfasts is \$450. Additional registrants from the same company qualify for a reduced rate of \$400. Current schedule is as follows:

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You should attend this seminar if you are involved in contracting for the use of computers or computer services-whether as a Corporate Executive, DP Manager, Contract Administrator, Consultant, Inside Counsel, or as a Private Practitioner involved with clients who use computers. Cost for the entire 21/2 day seminar, including continental breakfasts, luncheons, and complete resource materials is \$325. Additional registrants from the same company are charged only \$275. Current Schedule:

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Effective data base system design requires both a complete knowledge of the facilities provided by a data base package, and a basic understanding of the mechanisms which can be employed to construct data base systems. In fact, the former is of questionable value without the latter.

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- File Integration
- and much more

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This course runs for 3 days and costs \$350., including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule

Chicago **New York** Sheraton O'Hare Motel May 12-14

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- · Evaluating . . . and starting . . . key-disk systems
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Overcomes Incompatibility Problems

SNA Creates Uniform Net Environment

By Ronald A. Frank Of the CW Staff

NEW ORLEANS - The incompatability of today's overlapping data communications networks is a major constraint on growth, according to G.P. Fusco, product director for data communications systems

Most communications hardware and software products are not compatible, he

CW at Interface '75

said, and lines are frequently dedicated to a single terminal type controlled by a single communications control program.

In his keynote speech to more than 1,500 attendees at the Interface '75 conference here recently, Fusco said IBM's Systems Network Architecture (SNA) is an attempt to provide "a single uniform environment for data communications for

Instead of requiring that each system support its own lines with its own terminals, SNA will allow a user's application program to acquire terminals anywhere in his network; terminals in a network will be able to access multiple application programs, he said.

Four Elements

The SNA concept is represented by four main elements. And just as the original 360 architecture was carried forward into the 370 line, thereby outliving many of the products announced in 1964 with the 360, so SNA will outlive the "hardware and software products that represent its current announced implementations," Fusco predicted.

SNA represents IBM's Virtual Telecommunications Access Method (Vtam), Network Control Program (NCP), Synchronous Data Link Control (SDLC) and a "single family" approach to hard-ware, the IBM marketing official explained.

Vtám is a single communications control program which manages the connection and disconnection of terminals to application programs on a dynamically shared basis, he said. It allows a user's terminals to handle multiple application programs.

The NCP has responsibility for performing the tasks normally associated with the physical network requirements. Some of these are now being handled by the mainframe in current communications networks, Fusco said.

NCP can be resident in a programmable communications controller and multiple NCPs can operate under the control of a single Vtam, he said.

SDLC is the data transfer protocol that

defines the format by which data will be exchanged between two points in the network. To do this, SDLC depends on logical functions existing at both points.

Through this symmetrical logic, SDLC allows full-duplex transmission and multiple transmission without acknowledgment, he said.

The final element is SNA's family approach to terminals and terminal controllers. Some of these are general-purpose hardware and others are dedicated to a specific industry.

Under the SNA concept, each product can be made compatible with previous equipment and different terminal devices will be able to "co-reside on a common communications line," Fusco explained.

The SNA concept provides a hierarchical approach to data communications. The hierarchy consists of varying levels of logical capability that are func-



CW Photo by R. Frank

G.P. Fusco presents conference keynote speech.

tionally packaged with defined interfaces contained within a comprehensive architecture.

(Continued on Page 19)

Distributed DP Concepts Seen As Major Commitment at IBM

speech by IBM's G.P. Fusco apparently marked a major IBM commitment to distributed data processing concepts.

"Regardless of the ability of the industry to build larger and more reliable CPUs, the need for multiple, interrelated processors is going to be with us for a long time," he said.

Many organizations will insist on multiple CPUs based upon divisional autonomy or system backup, and many large communications users already see "a significant need for networking today," he told

Several specialized networking solutions

Analysis

using modified IBM system software and

hardware have already been created, he

These systems still fall short of a gen-

eralized networking concept which will

allow any terminal in a network to be

connected to any application in any proc-

essor in that network. Such networking

will include provisions for distributed operating systems and "distributed

The need for these capabilities will in-

tensify as it becomes necessary to per-

form load balancing and handle the stor-

A general networking concept will also

have to address the issues of data security

synchronized data bases," Fusco said.

age and retrieval of document images.

many communications networks today,

Although Fusco did not specifically mention communications transmission facilities, it was obvious that common centralized control of transmission will be required to implement the generalized networking concepts.

One possible way to assure the necessary transmission integrity would be through a satellite communications capability such as IBM has proposed.

In describing the benefits to be achieved by Systems Network Architecture (SNA) networks, Fusco was also drawing a blueprint that could best be achieved with broad-based communications systems such as satellites.

"Common connections between system elements allow fixed points of reference against which to measure diagnostic output, aiding in the isolation of system problems to a specific point of failure," Fusco said.

This statement takes on added significance when weighed with other recent IBM comments about the importance of remote diagnostic capabilities in networks, perhaps implemented using satel-

As a result of the common control provided by SNA, line protocols, device dependencies, network control and other communications systems details that now absorb too much of the user's valuable application development time will become far less inhibiting on programming productivity, he said.

SNA can be designed to execute par-(Continued on Page 19)

Full-Duplex 202 Coming From AT&T?

NEW YORK - AT&T may soon introduce a 1,200 bit/sec version of its 202 that can operate in full-duplex mode. Up to now, the only supplier with such a unit has been Vadic Corp. which first introduced its data set in

A large breadboard of the new Bell unit has reportedly been shown to several large users who said it duplicates many of the functions of the Vadic modem. But the AT&T unit would probably not be end-to-endcompatible with the Vadic VA 3400, these sources said.

Several users said they have been told by Bell marketing representatives they should hold off on acquiring a fullduplex 1,200 bit/sec modem because the Bell System will soon have a product for them.

One such user was told by a representative from Teletype Corp. the new modem is being developed to add a full-duplex capability to the AT&T Dataspeed 40 CRT.

Announcement Uncertain

Although breadboard versions of the data set have been demonstrated by representatives of Bell Laboratories, it is not clear how close individual Bell System operating companies are to announcing the device.

"We are exploring the possibility [of such a data set] with Bell Labs," an AT&T spokesman said, "but there is no announcement planned at this time and we do not yet know whether we will offer this product."

The Vadic VA 3400 is a replacement for the Bell 202 data set, but it also provides the user with several important advantages. The 202 requires about 400 msec per transmitted block of data to turn the line around in a half-duplex operation. The Bell modem can transmit in only one direction at a time.

But the VA 3400 operates in fullduplex mode, transmitting in both directions at once over a two-wire circuit. A similar full-duplex capability using the Bell 202 or similar non-Bell devices requires a four-wire connection with dual sets of modems.

City Added to Dataroute

OTTAWA - The Computer Communications Group of the Trans-Canada Telephone System (TCTS) has added Victoria, British Columbia, to its Dataroute.

Victoria is the 25th city on the Dataroute, the cross-Canada digital network which TCTS introduced with eleven locations two years ago.

The Dataroute is described as the world's first nationwide transmission net-

and error recovery on a level not found in trom T-Barl Two new RS232 monitoring or monitoring and patching New Series 5752 not only switches EIA data lines New Series 5736 in one switch now combines a switchable between equipment, but also adds front panel for EIA line with front panel, plug-in monitoring of the activity plug-in monitoring of 24 wires. Positive indication of and quality of every one of 24 lines, plus the added the switched position is clearly indicated by the capability of isolating and patching around faults. toggle's position. Fast. Accurate. Inexpensive. Available now. Available now. Write or phone today for complete literature, prices and the T-BAR Communications Systems Switching Chart.

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Communications Products Run Gamut at Conference

By Ronald A. Frank
Of the CW Staff

NEW ORLEANS – Data communications products ranging from terminals to test equipment were exhibited at Interface '75.

Sanders Data Systems of Nashua, N.H., displayed a message preparation system designed to replace clusters of teletype-writers. The message system can support up to eight clustered Sanders CRTs for message input and up to three dual cassettes for storage.

Data input via the terminal keyboards can be edited, stored in the cassette buffers and transmitted at speeds of 110- to 9.600 bit/sec.

The system employs teletypewriter protocol and is described as a plugcompatible replacement for clustered teletypewriter systems. It can replace clusters operating at a single site behind a message switcher, a spokesman said.

A cluster of 10 teletypewriters can be replaced by six CRTs, providing the user



CW Photo by R. Frank
Ferol McAlister demonstrates the Sanders
Message Preparation System at conference exhibition.

with a 40% savings plus additional capabilities such as editing. The latter is not possible with a teletypewriter "torn tape" system

A system with six terminals, three dual cassettes and an 810 controller costs \$40,240 plus \$215/mo maintenance. The turnkey capability on a 48-month lease costs \$1,140/mo.

Bell & Howell's Business Data Products Division, Pasadena, Calif., introduced a terminal system aimed at emulating the IBM 3275 display in remote job entry applications.

Called the IMR/3275, the system adds the ability to read optically marked cards. It supports binary synchronous communications up to 2,400 bit/sec in halfduplex mode on either private or dial-up lines.

The IMR/3275 includes a 4K-byte microprocessor, a card reader and a synchronous communications interface. A 60 line/min printer is optional.

The system costs \$8,000 to \$10,000 depending on configuration.

Codex Corp. of Newton, Mass., displayed its technical control system which includes monitoring, testing, diagnostics and restoral facilities in a single configuration.

Among the available capabilities are an audio monitor to give the user a quick indication of what is happening on the transmission line; a decibel meter to measure transmit and receive signal levels; an eye pattern generator to detect phase

Omnitec Introduces Coupler

PHOENIX - Omnitec Corp. has introduced the Model 701R acoustic coupler.

The Model 701R originate-only coupler is said to have fewer than half the number of components in previous models. The unit is compatible with the conversational terminals operating at data rates in excess of 450 bit/sec. It can also be supplied to operate at data rates in excess of 600 bit/sec, the firm said.

Delivery is off the shelf and price is \$341 from 2405 South 20th St., 85034.

hits, jitter, harmonic distortion and line hits; a patch panel for Bell's Data Access Arrangement (DAA) dial backup; and a digital monitor to check EIA interface levels.

A technical control system can be configured for systems as small as four modems, but a typical network includes between 10 and 20 modems, a spokesman said. A typical system costs about \$8,500 or \$400/mo on a two-year lease with maintenance. Codex will provide the necessary user training.

Terminal Workstation

Tano Corp. of Metairie, La., showed its TAC-100 terminal workstation which can operate with Hasp or as a 3780 or 2780 emulator. The basic system includes a Digital Equipment Corp. PDP-11 with 8K memory, a synchronous modem interface, bootstrap loader, cyclic redundance counter and CRT/keyboard console. Options include paper tape, magnetic tape units and plotters.

The terminal system operates under DEC RSX-11M software for real time or concurrent processing and Hasp-type data handling. Hasp and other bisynchronous protocols are used under RSX-11M and 2780 emulation is run using DEC's RSX-11D and RSTS/E software.

Selectable transmission speeds range from 2,400 bit/sec to 19.6 kbit/sec on dial-up or leased lines in Ebcdic transparent mode.

Price ranges from \$21,000 to \$49,000. A configuration called the Model 10 with a 125 line/min printer and 200 card/min readers costs \$21,000 or \$900/mo on a three-year lease.

Infotron Systems, Pennsauken, N.J., introduced its Timeline 180 time division

CW at Interface '75

multiplexer. The unit is end-to-end compatible with the firm's earlier Timeline 240 and can handle asynchronous or synchronous input channels transmitting from 37.5- to 9,600 bit/sec.

All codes up to eight bits can be handled and each channel can operate at a different speed with "little or no effect on bandwidth efficiency." A 16-channel system costs about \$4,400 on a 30-day delivery.

Univac exhibited its DCT 524 data terminal with cassette storage capability. The teleprinter operates at 110-, 150- or 300 bit/sec with Ascii code.

The cassette cannot be added to earlier models in the DCT series, but rental models can be swapped for the newer version, a spokesman said. The DCT costs

\$181/mo or \$5,042 purchase and is available in 60 days from Bluebell, Pa.

Spectron Corp. showed a buffered data transmission simulator for exercising terminals and controllers using data patterns taken from live on-line traffic. The unit stores data in an internal 8-bit by 1K-byte buffer or from a preprogrammed plug-in read-only memory (ROM).

It accepts start/stop data at any speed up to 9,600 bit/sec. The basic simulator costs \$1,850 with 256 bytes of ROM priced separately at \$300. The unit is available in 60 days from Mt. Laurel, N.J.

Paradyne Corp. of Largo, Fla., introduced an all-LSI 9,600 bit/sec OEM modem which it described as the first of its kind. The LSI-96 two-board PC set provides 4,800- and 9,600 bit/sec capability over voice grade lines.

Price ranges from \$2,000 to \$3,000 instead of the current \$7,000 to \$8,000 range and depends on quantity. The modem boards are designed to be integrated into other data devices.

Digi-Log Systems, Inc. introduced a synchronous model of its data line monitor designed to isolate faults. The CRT unit is placed between any two devices and all data that normally flows is displayed on the screen for monitoring purposes.

The unit is transparent to the line and costs \$2,145 from the company in Horsham, Pa.

Without DAA-Like Units

Direct User Interconnection Planned in Canada

By Gordon D. Hutchison

Special to Computerworld

OTTAWA — Canadian telephone companies are about to embark on a program to permit the attachment of a limited range of customer-owned terminal devices directly to the public switched telephone network

Through type approvals of terminals, customers will be able to connect non-network addressing terminals without the use of telephone company-supplied coupler devices.

Discussions about and investigations into the orderly introduction of a more liberalized attachment policy have been conducted by the Canadian government for a number of years.

DP customers presently must connect their terminals through couplers designed by the telephone carriers as a safety measure to protect their facilities, subscribers and personnel. Suppliers of terminals have argued they can build to accepted technical standards, eliminating the need for a coupler.

Strict Standards Testing

Federal officials, in cooperation with Bell Canada, British Columbia Telephone Company and CN/CP Telecommunications, are finalizing the implementation program and expect to release drafted technical standards in a few weeks. It is hoped manufacturers will be able to begin testing for type approval by late summer.

Equipment designed to work directly with the telephone network will have to be tested to strict technical standards, and it will be the responsibility of the manufacturer to obtain certification from the Canadian communications department.

For the DP industry, this means a broad

hard-wired into the telephone network – in association with a standard telephone set – eliminating acoustic couplers in many cases, The telephone companies haven't

The telephone companies haven't worked out the exact details of how these

devices will be permitted and how monthly charges will be affected. Until the program is fully implemented and new tariffs established, the existing requirement for a telephone company-supplied coupler will be enforced.

Low-Cost Graphics Terminals Cut \$400 from Tektronix Price

BEAVERTON, Ore. – Tektronix, Inc. has announced two graphic terminals. They are the E4010 and the E4010-1, the hard-copy-compatible version.

The E4010 is priced at \$3,795 which is \$400 less than the present 4010 terminal. The E4010-1 is priced at \$3,995, \$700 less than the present 4010-1, the company said.

The E4010 models have all features of the 4010s except thumbwheels to control

the cross-hair cursor. Graphic input is through the keyboard. The E4010 and E4010-1 have 11-in. flicker-free storage tubes, 63-character Ascii set (upper case) and 1,024 addressable points.

Tektronix software will be compatible with the E4010 and E4010-1.

The company address is Box 500,

IBM Seen Committed To Distributed DP

(Continued from Page 17)

tially in a CPU and partially in a terminal controller. This ability will significantly reduce processing loads at central DP sites while still maintaining central systems control, he said.

Remote processing will remain active even if the central site mainframe fails. Interactive applications can be designed so that controllers process certain requests with the CPU handling others.

Such distributed capability will reduce average transaction response times at remote terminals, he predicted.

Creates Uniform Network Environment

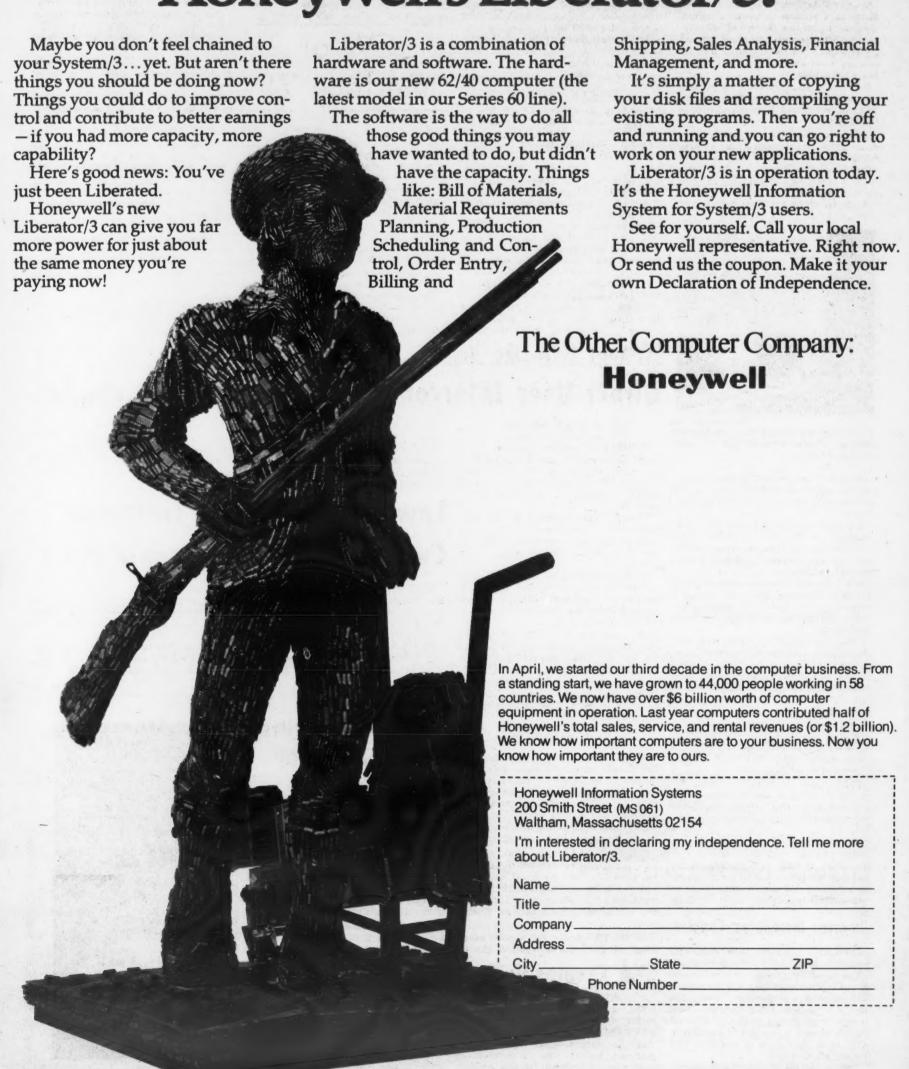
Management is going to be looking to the data communications systems for increased user productivity. Recent economic events have brought an unprecedented drive for increased efficiency, Fusco said, and data networks have great potential for improving the productivity of users which have access to them.



(Continued from Page 17)

The terminal with logical capability makes use of the terminal controller which has its own logical capability. The controller in turn makes use of the programmed logic in the communications controller (at the main DP site) which is supported by the host CPU, he said.

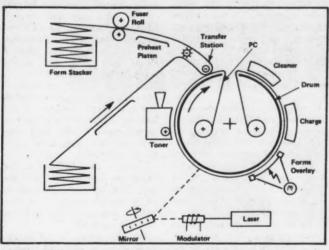
A declaration of independence for System/3 users: Honeywell's Liberator/3.



Two Views of IBM's 3800



IBM Demonstrated its 3800 printer to heavy crowds at the Hanover Fair. The printer will not be demonstrated at the NCC and, according to IBM, there are no present plans to demonstrate the unit in the U.S. before first deliveries are made in the third quarter of



IBM's 3800 printing subsystem uses a low-power laser to form character images on a light-sensitive photoconductor covering a rotating drum, as illustrated here. Toner - dry, ink-like powder which adheres only to these images, is applied to the photoconductor and transferred to paper. The photoconductor can be advanced periodically, providing a renewed printing surface.

As the drum turns, it passes the following points: charge, which prepares the photoconductor to receive a new image; forms overlay, which passes light through a film negative, projecting a design image on the photoconductor; laser, which creates designated characters on the photoconductor; toner station, which applies toner to the photoconductor; transfer station, where character images are transferred to paper; cleaner, where residue toner from a previous page image is loosened and removed.

stack of continuous-form paper, loaded at the 3800's input station, flows through the image transfer station, over a pre-heat platen and past a fuse roll, which fixes characters on the paper. The paper then is automatically refolded on a form stacker.

Xerox Expands 1200 Compatibility

EL SEGUNDO, Calif. - The Xerox 1200 printer will now print from tapes produced on Burroughs and Honeywell mainframes, in addition to the IBM and Univac Series 70 systems previously supported, Xerox said.

The new compatibility comes from enhancement of the 4,000 line/min, non-impact printer system's software, Xerox

The software incorporates keyword notation printer control commands and now follows a PL/I type syntax. Groups of commands can be catalogued into named sets and referenced by other commands.

The printer costs \$2,600/mo from the firm at 701 S. Aviation Blvd., 90245.

With the 62/40

Honeywell 'Liberates' S/3 Users

WALTHAM, Mass. - Honeywell has introduced a small Level 62 computer designed to "liberate" IBM System/3 computer

The Level 62 Model 62/40 in the \$2,400 to \$5,400 monthly rental range, offers eventual growth capability from the small to the largest Series 60 computers. It provides greater input/ output capabilities, greater communications capabilities, faster memory speed and greater memory capacity than the System/3, Honeywell claimed.

The Model 62/40 and its Level 62 GCOS operating system has several features not offered on the System/3 Model 10 including multiprogramming, MOS memory, a 96-column card reader, and an operator console with standard keyboard, numeric pad and magnetic tape cassette subsystem, the firm said.

The system has been marketed in Europe since last April, the company said. However, most of System/3-compatible features introduced at the Hanover Fair and a Liberator/3 marketing program are new.

The company also announced program product and hardware enhancements for the Level 62 category, which includes a larger Model 62/60 introduced last April.

System/3 users can implement their own programs on the Level 62 systems, Honeywell said, through the use of the "Liberator" package.

The Model 62/40 includes a CPU with 56K to 96K bytes of MOS main memory, 1 µsec access for two bytes, memory protection features, multiprogramming, a 140-instruction repertoire, six I/O channels and a maximum input/output transfer rate of 837 kbyte/sec for the system.

Software features include an RPG that is said to be syntactically and semantically compatible with System/3 RPG-II. A Cobol '74 compiler also is available.

Files created on System/3 disk drives can be read directly on Honeywell's new 11.6- to 46.4 Mbyte capacity disk cartridge system as well as on a previously announced 29.2 Mbyte disk unit. The Level 62 disk cartridge system reads files created on System/3 Type 5444 drives; Honeywell's MSU0310 disk

reads files created on System/3 Type 5445 drives. A 300 card/ min reader can be used with the disk system by computer users who do not use cards as turnaround documents and do not need all the functions they are paying for in the System/3 multifunction unit, Honeywell said.

A Model 62/40 with 56K bytes of main memory, 11.6 Mbyte of disk storage, 400 line/min printer, a 300 card/min 96-column card reader and system console with keyboard, 30 char./sec printer and one magnetic tape cassette unit can be leased for \$2,327/mo on a five-year contract or purchased for \$108,250. Monthly rental for RPG, sort/ merge and utilities would be an additional \$71 per month.

First customer deliveries are scheduled this quarter.

Peripheral Enhancements

An 800 line/min printer with 120 or optional 132 print positions also will be available in the fourth quarter of 1975 with the Model 62/40 and the previously announced Model 62/60.
Other enhancements enable the

Model 62/60 to use the System/ 3-compatible peripheral equipment that might be included in an upgrade from a 62/40.

Up to four magnetic tape units may be used with the 62/60 in configurations of from two to four units. A choice of 18.75 in./sec units that can transfer up to 30,000 bytes of information per second or 37.5 in./sec units that can transfer up to 60 kbyte/ sec is available. Both provide a choice of track handling capabilities, densities and data recording formats.

Program products for distributors have been added to the financial management and manu-

facturing programs already available with the Level 62 systems.

A sales-order processing system performs comprehensive order entry, billing and shipment, and inventory accounting functions. It also supplies reports and data needed for functions performed in other program systems such as general ledger, accounts receivable and comprehensive inventory management. It will be available in the fourth quarter of this year at a cost of \$216/mo.

An inventory management system for distributors that can be implemented in separately of-fered subsystems also will be available in the fourth quarter. All the subsystems are compatible with other Honeywell applications for the distribution industry and can be directly interfaced with the inventory accounting subsystem and the sales-order processing system, Honeywell said. It can be leased for \$162/mo and may be used in combination with either one of two inventory replenishment subsystems.

One inventory replenishment subsystem calculates order quantities for various replenishment policies; projects and compares the results of alternative replenishment actions, and produces a proposed order which a buyer may confirm or override. It can be leased for \$81/mo.

The other inventory replenishment subsystem adds joint ordering to independent ordering under Inventory Replenishment I and provides a strategy decision tool to compare the merits of both methods. It also schedules orders with relation to delivery limitations and offers management extra control information. It can be leased for \$135/mo.



Honeywell announced many of its IBM System/3 compatibility features at their booth at the Hanover Fair.

Trendata Model 1500 Cassette Tap **Conversational Terminal replaces** IBM 2741 & GTEIS 5550



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Key-Edit 60 Offers 4 to 24 Keystations

Mass. - Consolidated Computer's Key-Edit 60 key-to-disk data entry system is designed for small to medium-sized users. It includes: a processor with 32K words of core memory standard; disk capacity up to 5.6 million characters; the ability to handle from 4 to 24 data terminals, and powerful editing and processing features allowing highly flexible data manipulation, the firm said.

Optional hardware features include a data terminal transfer switch allowing data terminals to be switched among up to three Key-Edit 60 systems in multi-system operations, thereby providing backup protection.

There is a remote data terminal capability allowing Key-Edit 60 data terminals to be directly connected up to 6,000 feet from their processor without the need for a communications link. In addition, a numeric pad option can be added to the keyboard of the new data terminals.

In addition to providing users with the software capabilities of earlier Key-Edit systems, new features were added to the output editor including: multiply/divide (up to 19 digits);

broad flexibility of operation through device selection (user allocated tape/disk input/output), and print-image tape processing.

A fast new Sort/Merge capability, which helps to offload the mainframe, is also available. The user has flexibility in selecting tape or disk for input and output of files.

The input editor includes multiply and display capabilities. Other features are time reporting on the supervisor's console and the ability to send messages directly to any data terminal from the supervisor's console.

New communications software is also available for both the Key-Edit 60 and the Key-Edit 50 systems. The Key-Edit system can communicate with another Key-Edit 50/60 or 1000, as well as various mainframe computers in IBM 2780 mode.

A four keystation system, with tape drive and maintenance is priced at \$1,186/mo on a one vear lease.

A 24 keystation system, with two tape drives, 300 line/min printer and maintenance is priced at \$4,000/mo. The firm can be reached at 275 Wyman St., 02154.

Microfiche Use Lets

BIRMINGHAM, Ala. - Not all operating costs are still on the

In the operations of Southern Data Services, Inc. the DP affiliate of Southern Bancorporation here, the cost of running a trial balance from the computer service's largest bank affiliate has dropped substantially.

The reason: the program which used to take an hour and a half to run now takes a little over 10 minutes because the need for hard copy printout, a major slow-down factor of any computer operation, has been eliminated. Now, computer output goes to high speed magnetic tape, from which it can be reproduced on microfiche by an NCR Quantor 105 computeroutput-microfiche (COM) recorder.

In addition to saving computer time, Southern Data has also reduced forms costs. With operations up nearly 25% to a production level of between 750,000 and 1 million lines daily, paper usage has been budgeted at \$27,000/mo. With the use of microfiche, that need has been cut substantially.

The NCR COM has an automatic internal film processor. The system includes software for film indexing, titling and formatting. The fiche are delivered cut and dry at a rate of one per minute - the equivalent of 12,000 computer pages an hour, or 12,000 line/min. The COM system operates off-line on magnetic tape produced by any computer tape handler. The unit is compatible with IBM 360 and IBM 370 systems in use at Southern Data Services.

Applications include demand deposit, savings, commercial loans, trust, Bankamericard, plus all of the name/address listings

Address _

for the banks. (This alone is comprised of about 60 fiche holding 207 data pages each previously a bulky four-part form that had to be distributed, but which now fits into one envelope.)

With the increased capacity of COM, many departments can now get complete daily trial balances where they previously were only able to have transaction listings.

Distribution of data pages had always been a problem. With demand deposit printouts, for example, there was only enough hard copy available for each employee to work from one section of the completed trial balance sheet. With fiche, each person can have half or all of it.

There are now about 50 viewers in the Birmingham Trust & National Bank, largest of the banking affiliates. Fiche have replaced much of the hard copy printout that had been circulated previously.

Southern Data Services started using the Quantor 105 in January 1974, operating through an NCR service center until their volume was up enough to install their own system.

The new system is fast enough to meet all present and much of the contemplated future demands

When more than one fiche is needed, copies are made on a Bruning OP-40. At a previous cost of 1.5 cents per page, the 207 pages on one fiche would cost over \$3.10.

Still another benefit lies in the savings in records storage space. To meet legal retention requirements, one bank used to have to store two or three boxes of printout daily. Today, the same records are collected in one envelope.

Zip

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The National Computer Conference will be filled with better ideas than ever this year, and Computerworld will be there with up-to-theminute coverage in three special issues. The news begins before the show in our NCC Preview Issue, where we'll be telling you all about the products, exhibits and ideas you'll see. Next, our Editorial writers will report the latest details and developments of how it all happens in our NCC Show Issue. And our Post-Show Wrap-Up caps it all with in-depth reporting and analysis of the important events and stories of NCC. In all, you'll get three weeks of current information you'll use-so be sure you make Computerworld a part of your NCC plans.

If you're an advertiser in the EDP industry you should note that extra copies of Computerworld will be distributed right at the show, so you'll get more readership than ever. But don't miss the closing date--issues and ad closings are listed below. To get all the details, just contact your Computerworld salesman. Or call Judy Milford or Sara Steets at (617) 965-5800.

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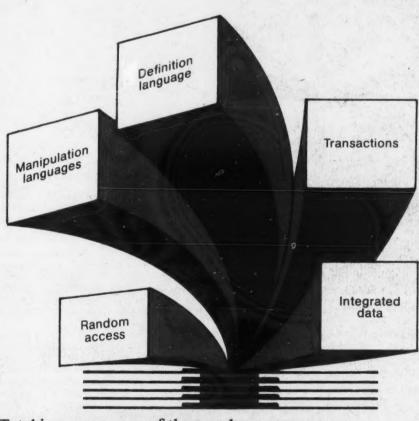
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Communications Products Run Gamut at Conference

By Ronald A. Frank Of the CW Staff

NEW ORLEANS - Data communications products ranging from terminals to test equipment were exhibited at Interface '75.

Sanders Data Systems of Nashua, N.H., displayed a message preparation system designed to replace clusters of teletypewriters. The message system can support up to eight clustered Sanders CRTs for message input and up to three dual cassettes for storage.

Data input via the terminal keyboards can be edited, stored in the cassette buffers and transmitted at speeds of 110- to 9,600 bit/sec.

The system employs teletypewriter protocol and is described as a plug-compatible replacement for clustered teletypewriter systems. It can replace clusters operating at a single site behind a message switcher, a spokesman said.

A cluster of 10 teletypewriters can be replaced by six CRTs, providing the user



Ferol McAlister demonstrates the Sanders Message Preparation System at con-

with a 40% savings plus additional capabilities such as editing. The latter is not possible with a teletypewriter "torn tape" system.

ference exhibition.

A system with six terminals, three dual cassettes and an 810 controller costs \$40,240 plus \$215/mo maintenance. The turnkey capability on a 48-month lease costs \$1,140/mo.

Bell & Howell's Business Data Products Division, Pasadena, Calif., introduced a terminal system aimed at emulating the IBM 3275 display in remote job entry applications.

Called the IMR/3275, the system adds the ability to read optically marked cards. It supports binary synchronous com-munications up to 2,400 bit/sec in halfduplex mode on either private or dial-up lines.

The IMR/3275 includes a 4K-byte microprocessor, a card reader and a synchronous communications interface. A 60 line/min printer is optional.

The system costs \$8,000 to \$10,000 depending on configuration.

Codex Corp. of Newton, Mass., displayed its technical control system which includes monitoring, testing, diagnostics and restoral facilities in a single configuration.

Among the available capabilities are an audio monitor to give the user a quick indication of what is happening on the transmission line; a decibel meter to measure transmit and receive signal levels; an eye pattern generator to detect phase

Omnitec Introduces Coupler

PHOENIX - Omnitec Corp. has introduced the Model 701R acoustic coupler.

The Model 701R originate-only coupler is said to have fewer than half the number of components in previous models. The unit is compatible with the conversational terminals operating at data rates in excess of 450 bit/sec. It can also be supplied to operate at data rates in excess of 600 bit/sec, the firm said.

Delivery is off the shelf and price is \$341 from 2405 South 20th St., 85034. hits, jitter, harmonic distortion and line hits; a patch panel for Bell's Data Access Arrangement (DAA) dial backup; and a digital monitor to check EIA interface

A technical control system can be configured for systems as small as four modems, but a typical network includes between 10 and 20 modems, a spokesman said. A typical system costs about \$8,500 or \$400/mo on a two-year lease with maintenance. Codex will provide the necessary user training

Terminal Workstation

Tano Corp. of Metairie, La., showed its TAC-100 terminal workstation which can operate with Hasp or as a 3780 or 2780 emulator. The basic system includes a Digital Equipment Corp. PDP-11 with 8K memory, a synchronous modem interface, bootstrap loader, cyclic redundance counter and CRT/keyboard console. Options include paper tape, magnetic tape units and plotters.

The terminal system operates under DEC RSX-11M software for real time or concurrent processing and Hasp-type data handling. Hasp and other bisynchronous protocols are used under RSX-11M and 2780 emulation is run using DEC's RSX-11D and RSTS/E software.

Selectable transmission speeds range from 2,400 bit/sec to 19.6 kbit/sec on dial-up or leased lines in Ebcdic trans-

Price ranges from \$21,000 to \$49,000. A configuration called the Model 10 with a 125 line/min printer and 200 card/min readers costs \$21,000 or \$900/mo on a three-year lease.

Infotron Systems, Pennsauken, N.J., introduced its Timeline 180 time division

Interface '75

patible with the firm's earlier Timeline 240 and can handle asynchronous or synchronous input channels transmitting from 37.5- to 9,600 bit/sec.

All codes up to eight bits can be handled and each channel can operate at a different speed with "little or no effect on bandwidth efficiency." A 16-channel system costs about \$4,400 on a 30-day delivery.

Univac exhibited its DCT 524 data terminal with cassette storage capability. The teleprinter operates at 110-, 150- or 300 bit/sec with Ascii code.

The cassette cannot be added to earlier models in the DCT series, but rental models can be swapped for the newer version, a spokesman said. The DCT costs

\$181/mo or \$5,042 purchase and is available in 60 days from Bluebell, Pa.

Spectron Corp. showed a buffered data transmission simulator for exercising terminals and controllers using data patterns taken from live on-line traffic. The unit stores data in an internal 8-bit by 1K-byte buffer or from a preprogrammed plug-in read-only memory (ROM).

It accepts start/stop data at any speed up to 9,600 bit/sec. The basic simulator costs \$1,850 with 256 bytes of ROM priced separately at \$300. The unit is available in 60 days from Mt. Laurel, N.J.

Paradyne Corp. of Largo, Fla., introduced an all-LSI 9,600 bit/sec OEM modem which it described as the first of its kind. The LSI-96 two-board PC set provides 4,800- and 9,600 bit/sec capability over voice grade lines.

Price ranges from \$2,000 to \$3,000 instead of the current \$7,000 to \$8,000 range and depends on quantity. The modem boards are designed to be integrated into other data devices.

Digi-Log Systems, Inc. introduced a synchronous model of its data line monitor designed to isolate faults. The CRT unit is placed between any two devices and all data that normally flows is displayed on the screen for monitoring purposes.

The unit is transparent to the line and costs \$2,145 from the company in Horsham, Pa.

Without DAA-Like Units

Direct User Interconnection Planned in Canada

By Gordon D. Hutchison Special to Computerworld

OTTAWA - Canadian telephone companies are about to embark on a program to permit the attachment of a limited range of customer-owned terminal devices directly to the public switched telephone network.

Through type approvals of terminals, customers will be able to connect nonnetwork addressing terminals without the use of telephone company-supplied cou-

Discussions about and investigations into the orderly introduction of a more liberalized attachment policy have been conducted by the Canadian government for a number of years.

DP customers presently must connect their terminals through couplers designed by the telephone carriers as a safety measure to protect their facilities, subscribers and personnel. Suppliers of terminals have argued they can build to accepted technical standards, eliminating the need for a coupler.

Strict Standards Testing

Federal officials, in cooperation with Bell Canada, British Columbia Telephone Company and CN/CP Telecommunications, are finalizing the implementation program and expect to release drafted technical standards in a few weeks. It is hoped manufacturers will be able to begin testing for type approval by late summer.

Equipment designed to work directly with the telephone network will have to be tested to strict technical standards, and it will be the responsibility of the manufacturer to obtain certification from the Canadian communications depart-

For the DP industry, this means a broad range of data interface devices can be mote terminals, he predicted.

hard-wired into the telephone network - in association with a standard telephone set - eliminating acoustic couplers in many cases.

The telephone companies haven't worked out the exact details of how these

devices will be permitted and how monthly charges will be affected. Until the program is fully implemented and new tariffs established, the existing requirement for a telephone company-sup-

Low-Cost Graphics Terminals Cut \$400 from Tektronix Price

BEAVERTON, Ore. - Tektronix, Inc. has announced two graphic terminals. They are the E4010 and the E4010-1, the hard-copy-compatible version.

The E4010 is priced at \$3,795 which is \$400 less than the present 4010 terminal. The E4010-1 is priced at \$3,995, \$700 less than the present 4010-1, the company said

The E4010 models have all features of the 4010s except thumbwheels to control

IBM Seen Committed To Distributed DP

(Continued from Page 17)

tially in a CPU and partially in a terminal controller. This ability will significantly reduce processing loads at central DP sites while still maintaining central systems control, he said.

Remote processing will remain active even if the central site mainframe fails. Interactive applications can be designed so that controllers process certain requests with the CPU handling others.

Such distributed capability will reduce transaction resnonce

SNA Creates Uniform Network Environment

Management is going to be looking to the data communications systems for increased user productivity. Recent economic events have brought an unprecedented drive for increased efficiency, Fusco said, and data networks have great potential for improving the productivity of users which have access to them.

the cross-hair cursor. Graphic input is through the keyboard. The E4010 and E4010-1 have 11-in. flicker-free storage tubes, 63-character Ascii set (upper case) and 1,024 addressable points.

Tektronix software will be compatible with the E4010 and E4010-1.

The company address is Box 500, 97005.



(Continued from Page 17)

The terminal with logical capability makes use of the terminal controller which has its own logical capability. The controller in turn makes use of the programmed logic in the communications controller (at the main DP site) which is supported by the host CPU, he said.

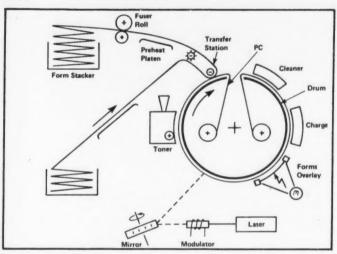
A declaration of independence for System/3 users: Honeywell's Liberator/3.



Two Views of IBM's 3800



IBM Demonstrated its 3800 printer to heavy crowds at the Hanover Fair. The printer will not be demonstrated at the NCC and, according to IBM, there are no present plans to demonstrate the unit in the U.S. before first deliveries are made in the third quarter of



IBM's 3800 printing subsystem uses a low-power laser to form character images on a light-sensitive photoconductor covering a rotating drum, as illustrated here. Toner - dry, ink-like powder which adheres only to these images, is applied to the photoconductor and transferred to paper. The photoconductor can be advanced periodically, providing a renewed printing surface.

As the drum turns, it passes the following points: charge, which prepares the photoconductor to receive a new image; forms overlay, which passes light through a film negative, projecting a design image on the photoconductor; laser, which creates designated characters on the photoconductor; toner station, which applies toner to the photoconductor; transfer station, where character images are transferred to paper; cleaner, where residue toner from a previous page image is loosened and removed.

A stack of continuous-form paper, loaded at the 3800's input station, flows through the image transfer station, over a pre-heat platen and past a fuse roll, which fixes characters on the paper. The paper then is automatically refolded on a form stacker.

Xerox Expands 1200 Compatibility

EL SEGUNDO, Calif. - The Xerox 1200 printer will now print from tapes produced on Burroughs and Heneywell mainframes, in addition to the IBM and Univac Series 70 systems previously supported, Xerox said.

The new compatibility comes from enhancement of the 4,000 line/min, non-impact printer system's software, Xerox

The software incorporates keyword notation printer control commands and now follows a PL/I type syntax. Groups of commands can be catalogued into named sets and referenced by other commands

The printer costs \$2,600/mo from the firm at 701 S. Aviation Blvd., 90245

With the 62/40

Honeywell 'Liberates' S/3 Users

WALTHAM, Mass. - Honey-well has introduced a small Level 62 computer designed to "liber-IBM System/3 computer

The Level 62 Model 62/40 in the \$2,400 to \$5,400 monthly rental range, offers eventual growth capability from the small to the largest Series 60 computers. It provides greater input/ output capabilities, greater communications capabilities, faster memory speed and greater memory capacity than the System/3, Honeywell claimed.

The Model 62/40 and its Level 62 GCOS operating system has several features not offered on the System/3 Model 10 including multiprogramming, MOS memory, a 96-column card reader, and an operator console with standard keyboard, numeric pad and magnetic tape cassette subsystem, the firm said.

The system has been marketed in Europe since last April, the company said. However, most of the System/3-compatible features introduced at the Hanover Fair and a Liberator/3 marketing program are new

The company also announced program product and hardware enhancements for the Level 62 category, which includes a larger Model 62/60 introduced last April.

System/3 users can implement their own programs on the Level 62 systems, Honeywell said, through the use of the "Liberator" package.

The Model 62/40 includes a CPU with 56K to 96K bytes of MOS main memory, 1 usec access for two bytes, memory protection features, multiprogramming, a 140-instruction repertoire, six I/O channels and a maximum input/output transfer rate of 837 kbyte/sec for the system.

Software features include an RPG that is said to be syntactically and semantically compatible with System/3 RPG-II. A Cobol '74 compiler also is available.

Files created on System/3 disk drives can be read directly on Honeywell's new 11.6- to 46.4 Mbyte capacity disk cartridge system as well as on a previously announced 29.2 Mbyte disk unit. The Level 62 disk cartridge system reads files created on System/3 Type 5444 drives; Honeywell's MSU0310 disk reads files created on System/3 Type 5445 drives. A 300 card/ min reader can be used with the disk system by computer users who do not use cards as turnaround documents and do not need all the functions they are paying for in the System/3 multifunction unit, Honeywell said.

A Model 62/40 with 56K bytes of main memory, 11.6 Mbyte of disk storage, 400 line/min printer, a 300 card/min 96-column card reader and system console with keyboard, 30 char./sec printer and one magnetic tape cassette unit can be leased for \$2,327/mo on a five-year contract or purchased for \$108,250. Monthly rental for RPG, sort/ merge and utilities would be an additional \$71 per month.

First customer deliveries are scheduled this quarter.

Peripheral Enhancements

An 800 line/min printer with 120 or optional 132 print positions also will be available in the fourth quarter of 1975 with the Model 62/40 and the previously announced Model 62/60.

Other enhancements enable the Model 62/60 to use the System/ 3-compatible peripheral equipment that might be included in an upgrade from a 62/40.

Up to four magnetic tape units may be used with the 62/60 in configurations of from two to four units. A choice of 18.75 in./sec units that can transfer up to 30,000 bytes of information per second or 37.5 in./sec units that can transfer up to 60 kbyte/ sec is available. Both provide a choice of track handling capabilities, densities and data recording formats.

Program products for distributors have been added to the financial management and manufacturing programs already available with the Level 62 systems.

A sales-order processing system performs comprehensive order entry, billing and shipment, and inventory accounting functions. It also supplies reports and data needed for functions performed in other program systems such as general ledger, accounts receivable and comprehensive inventory management. It will be available in the fourth quarter of this year at a cost of \$216/mo.

An inventory management system for distributors that can be implemented in separately offered subsystems also will be available in the fourth quarter. All the subsystems are compatible with other Honeywell applications for the distribution industry and can be directly interfaced with the inventory accounting subsystem and the sales-order processing system, Honeywell said. It can be leased for \$162/mo and may be used in combination with either one of two inventory replenishment subsystems.

One inventory replenishment subsystem calculates order quantities for various replenishment policies; projects and compares the results of alternative replenishment actions, and produces a proposed order which a buyer may confirm or override. It can be leased for \$81/mo.

The other inventory replenishment subsystem adds joint ordering to independent ordering under Inventory Replenishment I and provides a strategy decision tool to compare the merits of both methods. It also schedules orders with relation to delivery limitations and offers management extra control information. It can be leased for



Honeywell announced many of its IBM System/3 compatibility features at their booth at the Hanover Fair.

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Key-Edit 60 Offers 4 to 24 Keystations

WALTHAM, Mass. - Consolidated Computer's Key-Edit 60 key-to-disk data entry system is designed for small to medium-sized users. It includes: a processor with 32K words of core memory standard; disk capacity up to 5.6 million characters; the ability to handle from 4 to 24 data terminals, and powerful editing and processing features allowing highly flexible data manipulation, the firm said.

Optional hardware features include a data terminal transfer switch allowing data terminals to be switched among up to three Key-Edit 60 systems in multi-system operations, thereby

providing backup protection.

There is a remote data terminal capability allowing Key-Edit 60 data terminals to be directly connected up to 6,000 feet from their processor without the need for a communications link. In addition, a numeric pad option can be added to the keyboard of the new data terminals

In addition to providing users with the software capabilities of earlier Key-Edit systems, new features were added to the output editor including: multiply/divide (up to 19 digits);

broad flexibility of operation through device selection (user allocated tape/disk input/output), and print-image tape processing.

A fast new Sort/Merge capability, which helps to offload the mainframe, is also available. The user has flexibility in selecting tape or disk for input and output of files.

The input editor includes multiply and display capabilities. Other features are time reporting on the supervisor's console and the ability to send messages directly to any data terminal from the supervisor's console.

New communications software is also available for both the Key-Edit 60 and the Key-Edit 50 systems. The Key-Edit system can communicate with another Key-Edit 50/60 or 1000, as well as various mainframe computers in IBM 2780 mode.

A four keystation system, with tape drive and maintenance is priced at \$1,186/mo on a one year lease.

A 24 keystation system, with two tape drives, 300 line/min printer and maintenance is priced at \$4,000/mo. The firm can be reached at 275 Wyman St., 02154.

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Microfiche Use Lets Bank Fix Balance Problems Fast

operating costs are still on the

In the operations of Southern Data Services, Inc. the DP affiliate of Southern Bancorporation here, the cost of running a trial balance from the computer service's largest bank affiliate has dropped substantially.

The reason: the program which used to take an hour and a half to run now takes a little over 10 minutes because the need for hard copy printout, a major slow-down factor of any computer operation, has been eliminated. Now, computer output goes to high speed magnetic tape, from which it can be reproduced on microfiche by an NCR Quantor 105 computeroutput-microfiche (COM) recorder.

In addition to saving computer time, Southern Data has also reduced forms costs. With operations up nearly 25% to a production level of between 750,000 and 1 million lines daily, paper usage has been budgeted at \$27,000/mo. With the use of microfiche, that need has been cut substantially.

The NCR COM has an automatic internal film processor. The system includes software for film indexing, titling and formatting. The fiche are delivered cut and dry at a rate of one per minute - the equivalent of 12,000 computer pages an hour, or 12,000 line/min. The COM system operates off-line on magnetic tape produced by any computer tape handler. The unit is compatible with IBM 360 and IBM 370 systems in use at Southern Data Services.

Applications include demand deposit, savings, commercial loans, trust, Bankamericard, plus all of the name/address listings

comprised of about 60 fiche holding 207 data pages each previously a bulky four-part form that had to be distributed, but which now fits into one envelope.)

With the increased capacity of COM, many departments can now get complete daily trial balances where they previously were only able to have transaction listings.

Distribution of data pages had always been a problem. With demand deposit printouts, for example, there was only enough hard copy available for each employee to work from one section of the completed trial balance sheet. With fiche, each person can have half or all of it.

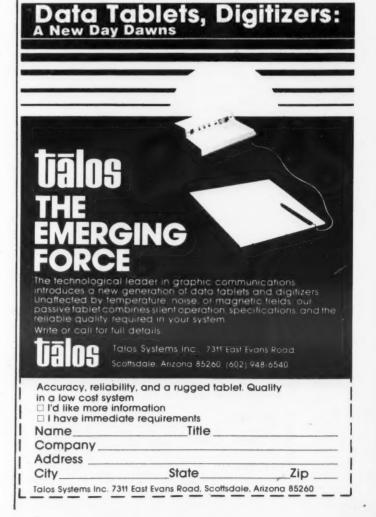
There are now about 50 viewers in the Birmingham Trust & National Bank, largest of the banking affiliates. Fiche have replaced much of the hard copy printout that had been circulated previously.

Southern Data Services started using the Quantor 105 in January 1974, operating through an NCR service center until their volume was up enough to install their own system.

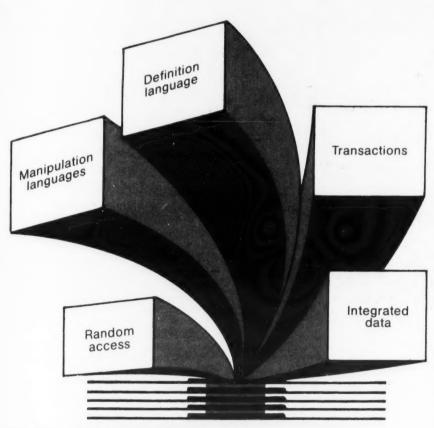
The new system is fast enough to meet all present and much of the contemplated future de-

When more than one fiche is needed, copies are made on a Bruning OP-40. At a previous cost of 1.5 cents per page, the 207 pages on one fiche would cost over \$3.10.

Still another benefit lies in the savings in records storage space. To meet legal retention requirements, one bank used to have to store two or three boxes of printout daily. Today, the same records are collected in one envelope.



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If you've wanted to convert to a Total data base management system, but stopped because what you saw was either too expensive or wasn't total, check out the Varian V-70 with Total.

Call your local Varian office. Or write Varian Data Machines, 2722 Michelson Drive, Irvine, CA 92664, (714) 833-2400.



For Fireman's Insurance

Planning Pays Off in Moving 370/168s 20 Miles

By Patrick Ward Of the CW Staff

SAN FRANCISCO — It's no easy task for a user to move two IBM 370/168s to a newly built data center 20 miles away. In fact, Fireman's Fund American Insurance Companies spent over a year planning such a transfer from San Francisco to San Rafael. Calif.

The changeover came in April with "unexpected smoothness," according to Joe Verner, who coordinated the move for the company. "Many of us are still very surprised," he said.

The two 168s share peripherals to handle auditing, accounting, billing and statistical services. A data communications network links them to six satellite DP centers and 49 company branch offices.

Fireman's Fund considered several alternate ways to move the CPUs, Verner

stated. One plan was to install one or more rented 168s at San Rafael that would be returned to IBM once the company had completed moving its own purchased CPUs to the site.

But a rented 168 costs about \$100,000/mo with a three-month minimum, Verner pointed out.

Another "gutsier" idea was to move the two 168s at the same time and finish the whole business as quickly as possible. But this would have left the insurance company without the 168s for three- to five days at a minimum, Verner said.

Middle Course

The company adopted a middle course that avoided renting a 168 and kept up continuous 168 service during the transition.

The first step was to put in a set of peripherals at San Rafael. This gear in-

cluded five printers, three tape control units, 24 tape drives, three banks of 3330 disk drives, two drum systems, two 3705 communications control units and card readers and punches.

The equipment was all installed and tested two weeks before the first CPU arrived.

Fireman's Fund later returned most of this equipment to vendors when the move was finished. Some of it replaced items not brought from San Francisco.

As part of its advance planning, Fireman's Fund already had had IBM preinstall cabling other than the CPUs' own cabling.

"We traded them for all the cabling under the floor in San Francisco after we got out," Verner said. The cable at San Rafael was all checked out and labeled ahead of time.

The first 168 arrived on the weekend of

March 29, coming via Neptune World Wide Moving with police escort fore and aft. There was a 33-hour stretch between hitting the "power off" button in San Francisco and having the system ready for use in San Rafael, Verner said.

Fireman's Fund did a system checkout of the San Rafael 168 during the following week. During that time, the company put its entire workload on the 168 remaining in San Francisco.

Earlier tests had shown this workload



Engineers from Fireman's Fund American Insurance Companies and IBM dismantled and reassembled one of Fireman's Fund's 25-ton computers in 10 hours.

would be too much for a single machine, Verner said. The company's answer was to double up production cycles, so that a job usually ran daily would run three time/week, for example.

"We also reduced the number of TSO terminals we served and the number of TSO regions," he added.

And since the company found "we couldn't run our production work and our TSO and batch testing" at the same time on one CPU, it ruled production would run from 4 p.m. to 8 a.m., and TSO and batch testing from 8 a.m. to 4 p.m.

The one time the shop waived this rule, trouble flared up, Verner said.

Split Operation

The next weekend, Fireman's Fund began a split data center operation by transferring testing and TSO to the San Rafael CPU. Production work continued on the San Francisco machine.

In a 41-hour effort the following weekend, the company brought the remaining 168 and all peripherals from San Francisco. This included 40 tape drives, five tape control units, six banks of 3330 disk drives, four printers, a 3M COM unit and a Scan Data OCR unit.

Fireman's Fund was up to full production at San Rafael by midnight on Sunday, April 12 Verser said

day, April 13, Verner said.

He praised the joint efforts of about eight Fireman's Fund staffers and "about 40 IBMers" who handled the move. He also stressed the contingency planning that had "every conceivable problem in mind," according to Melvin Durao, vice-president of the insurance firm's computer services department.

Sapphire Blades Used in Bow Tape Cleaner

BAILEY'S CROSSROADS, Va. – The Model 222 magnetic tape precision winder/cleaner from Bow Industries, Inc. uses a sapphire blade-cleaning device to help users forestall I/O errors and increase tape life, according to the firm.

The unit also provides programmed tension winding to allow safe shipment or prolonged storage of tapes, the firm said.

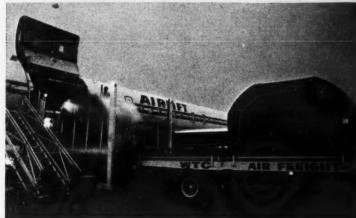
The Model 222 costs \$3,700 from the firm at 5819 Seminary Road, 22041.

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Mini Bits

DEC Low-Cost Tape System Works With PDP-8, PDP-11

MAYNARD, Mass. - A low-cost, 9-track magnetic tape system for use with PDP-8 and PDP-11 minicomputers is now available from Digital Equipment Corp. Called the TS03, the drive has a read/ write speed of 12.5 in./sec, uses an industry-compatible, 800 bit/in. recording

format and-7-in. tape reels, DEC said. The system is priced at \$6,450 with PDP-8 controller and \$6,950 with PDP-11 controller. A second tape drive, which uses the master system's controller and power supply, can be added for \$3,500. Shipments are scheduled for June, the firm said.

The cost of the TS03 makes it attractive for data logging, interchange and disk backup applications in small systems and for all other applications not requiring high transfer rates, DEC said. High reliability standards assure a calculated mean time without failure of 5,000 hours, DEC added.

The TS03 is compatible with operating system software used by DEC's larger TU10 magnetic tape system.

Modcomp Adds 3330-Type Disk

FORT LAUDERDALE, Fla. - Modular Computer Systems, Inc. (Modcomp) has added to its line an IBM 3330-type disk, with 84M-byte storage capacity. The unit is supported by the company's MAX IV real-time multiprogramming operating system.

At the same time, the company announced price reductions ranging to more than 17% on previously available disk storage devices of 12.3 M-byte and 24.6 M-byte storage capacities.

A dual access option allows a drive to be connected to two different controllers enabling two Modcomp computers to read and write on the same disk, a critical feature for real-time process control applications. In this mode, the drive communicates with either of the two controllers at any time, remaining in a ready condition for the other.

The drive is offered in four different configurations. The drive alone is priced at \$28,000. One drive and a single controller cost \$35,000, while a drive coupled with a dual access device is priced at \$33,000. A single drive, dual access option and two controllers cost \$46,000. Delivery is scheduled for the fourth quarter.

The firm is at 1650 W. McNab Road, 33309

SAC Graf/Pen Cursor Available

SOUTHPORT, Conn. - A cursor, interchangeable with the standard pen/stylus as the data input device for its Graf/Pen sonic digitizer, has been introduced by Science Accessories Corp. (SAC).

The cursor was designed to complement pen/stylus, according to SAC, by providing greater accuracy where speed in tracing lines is relatively less important. The accuracy of the cursor stems from the use of precision cross hairs which the operator places on the point or line to be digitized, the firm said.

Specific uses for the cursor include such recision inputs as those encountered digitizing printed circuit drawings, in architectural drafting systems and in the syntheses of molecular structures.

The Graf/Pen cursor is available in two versions, with a single control button or with four buttons. In both versions, one button is used by the operator to activate the digitization process.

The single-button version costs \$135 and the four-button device \$200 from the firm at Kings Highway West, 06490.

Informal User Group Survey Finds

S/32 Users Won't Hire Outside DPers

Of the CW Staff

LAS VEGAS - Former clerks, bookkeepers or possibly an office manager will operate and program the IBM System/32 in a typical user's firm, according to an informal survey made by the International System/32 Users group (ISU).

The responses showed System/32 users think it will be easier to train people familiar with their company's operations than to teach the business to outside DPers.

Also, many of the user firms cannot afford to hire an experienced DP staff, the survey stated.

One user expects to train several people from various departments to run the system to meet each department's needs. This will avoid the cost of a full-time DP staff and limit dependence on any one person, the survey noted.

The System/32 makes this approach feasible because it is "easy enough to learn and has ample software/hardware safeguards against improper use," the ISU stated.

IBM's Industry Application Programs (IAP) can fill the entire software needs of some firms, the ISU report noted.

RPG-II Talent Available

Alternatively, there is "an ample supof contract programmers familiar with RPG-II who can do the initial programming and then train the user's staff to operate the System/32, the survey stated.

This availability of RPG-II talent "seemed to be a significant factor in management's decision to obtain a System/32," the ISU said.

Many firms surveyed also stressed the number of local schools teaching the language and the numerous RPG-II application systems on the market which could be modified to run on the System/32.

In the same vein, several firms that did not want to get involved with programming cited the IAPs available from IBM.

As for the System/32's capacity to keep up with a company's growth, one user said "our next step . . . would be to increase its disk capacity and printer speed. Given the tight economic times, the survey asked firms why they decided to

"The only factors holding us back to date have been the price, complexity and 'mystery' of computers in general," one user explained.

bring in a computer system.

"We feel the System/32 ... meets our requirements as far as price and size are concerned. It's about time somebody has designed a computer stressing ease of operation for 'laymen' such as ourselves, yet still retaining high-speed technology and computing power."

Another said economic troubles leave his company little margin for error in over- or understocking inventory. That will be its first application.

"Even though our business is way off, this is the time we felt ripe for our firm to install a computer," a third user said. "As business improves and increases, it

will be harder for us to convert," he added.

This way, the company will be ready for the "inevitable business rebound."

From what it has been able to determine, the ISU said the contracting, paving and construction industry, the medical field and wholesalers of all types seem to be especially interested in the System/32. Accountants, service bureaus, banking and financial management organizations and manufacturers generally show the same high interest, the ISU said.

The ISU is at 1700 E. Desert Inn Road. Suite 109, 89109.

Praise From Veteran

LAS VEGAS - The International System/32 Users Group (ISU) installed its own System/32 on March 18, making the organization one of the nation's veteran users.

While the ISU has not yet published an overall evaluation of its IBM System/32, it did praise two system utilities and the unit's console CRT in the May ISU bulletin.

The user group's first application involved converting several thousand records from a manual file of the National Association of System/3 Users.

The ISU, in fact, had to key the entire file onto the System/32 and produce mailing labels and statistical data within a week of the mini's installation in order to mail out monthly newsletters on time.

The manual file did not have member numbers assigned, since the ISU had never been computerized and had no

need for them.

The ISU staff had little lead time to write RPG-II programs in advance or to take courses on the System/32. Instead, its staff had to rely on the basic IBM instruction and reference manuals that arrived prior to installa-

"The big time-saver for us was our use of IBM's utilities, the Source Entry Utility (SEU) and Data File Utility (DFU)," the ISU stated.

This software allowed the user group to quickly convert its manual files and to have the System/32 "automatically assign a number for each member we simultaneously keyed in names and addresses and other data.

"Once we had set up the formats for SEU and DFU and the file had been keyed in, we then used DFU for file maintenance, making address changes, etc.," the ISU said.

The organization next used DFU to sort the entire file by Zip Code for bulk mailing. The sort took under two minutes for over 3,000 records.

"At this point, we wrote a simple RPG-II label writing program, printed our labels and mailed out our newsletters on schedule." The ISU then backed up its member file on diskettes, which took about a minute.

The user group highly recommended the SEU and DFU utilities since "they can save a good deal of programming effort for source entry and file mainte-nance programs" and also permit users to quickly produce "one-time programs" that management needs in a

The ISU also had kind words for the CRT display unit on the System/32. The CRT "prompted our keyboard operator, step by step, through our file conversion, indicating exactly what was being keyed in," the ISU noted.

The display shows keying errors, which can be easily corrected, the ISU

noted.

"The constant interfacing between CRT and the keyboard operator (or computer operator) is a vital factor" in successful use of the System/32, the group said.

"There is little that an operator can do wrong providing he can read the display and follow simple instructions," the ISU concluded.

Centronics 104

HANOVER, West Germany - Centronics picked the Hanover Fair as the place to announce its 660 char./sec 9 by 7 dot matrix printer, the Model 104.

Through the use of four print heads and bidirectional printing, the 104 is capable of 200 line/min at 132 char./line, the vendor said.

The printer has an automatic on-off motor control which automatically down sequences the printer when not in use. The printer is automatically powered up when data is received with no delay time required before printing is initiated, the firm said.

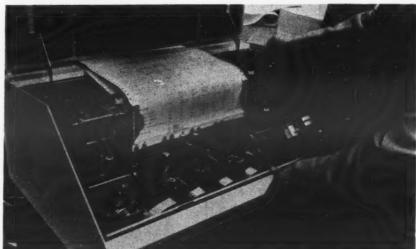
In addition, the printer has a two-channel vertical format control unit, audio alarm alert for a paper empty condition, self-contained test print feature, operator selectable 6 line/in. or 8 line/in. vertical spacing and a vertical paper motion slew rate of 8 in./sec, according to Centronics.

The standard 64 Ascii character set can be increased to 96 characters or 128 characters, selecting from 30 international languages and other 9 by 7 dot matrix character sets as an option, the

firm added.

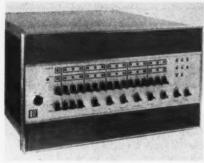
Forms are fed from the bottom of the printer in the cabinet enclosure and stacked in the back of the printer.

Serial and parallel interfaces are optional. The 103 is priced in the mid-\$3,000 range for large orders. The firm is in Hudson, N.H., 03051.



CW Photo by V. Farme

Centronics Model 104 Printer



Keronix IDS-16

IDS-16 16-Bit Series Compatible With Novas Offered by Keronix

SANTA MONICA, Calif. – Keronix, Inc. has introduced a series of 16-bit Data General Corp. Nova-compatible minicomputers. Designated the IDS-16 series, the models are available with up to 64K words of directly accessible memory and cycle times of 800, 1,000 or 1,200 nsec.

The minicomputers are equipped with a hinged front panel to front load all CPU, memory and I/O boards, making changes easy. Standard features also include power fail/restart, forced air cooling and an easily serviceable power supply with 50% more power than Novas, Keronix said.

A single-bus structure is used, implemented with tristate logic elements. This asynchronous, bidirectional structure is common to memory and all I/O devices. Properly equipped I/O controllers can communicate directly with each other or with memory — without CPU intervention (other than start-up), the firm said.

The CPU has four 16-bit accumulators. Two accumulators can be used as index registers.

Memory referencing may be direct or indirect in page zero, relative or base register indexing mode, the firm added. Input/output data transfers can be accomplished in the programmed, standard data channel or high-speed data transfer mode. Up to 62 I/O controllers, each having a unique device address, can be accommodated.

Four Slot Capacities

The unit comes in four different slot capacities: four slots and eight slots in a 5-1/4-in. high chassis, 10 slots and 17 slots in a 10-1/2-in. chassis. The central processor occupies one slot on all models; a 16K-word memory module occupies another slot.

Options include an "autoload" feature that permits loading of a 32-word bootstrap program, a multiply/divide capability (hardware) and a memory allocation and protection feature.

Keronix also offers a one-year warranty.

A 4K mini is priced at \$2,900. A 64K

CPU is priced at \$13,200

CPU is priced at \$13,300.

The firm is at 1752 Cloverfield Blvd.,

Data Transfer Interface Links Reader, Card Device

BELLEVILLE, N.J. – The Data Transfer Interface/96 from Kimball Systems can link the company's retail and industrial punch ticket reader to a Decision Data 96-column punch card device.

The Kimball punch ticket reader leases at \$350/mo on a one-year lease, and the data transfer interface costs \$250/mo from the firm at 151 Cortlandt St., 07109.

Preston Converter Expands

ANAHEIM, Calif. – The GMAD-4 analog-to-digital converter operates at a 25 msec conversion time and can be expanded to over 1,000 channels, according to the vendor, Preston Scientific, Inc.
The GMAD-4 costs \$1,538 with a full

The GMAD-4 costs \$1,538 with a full 256-channel system priced at \$5,436 from the firm at 805 E. Cerritos Ave., 92805

Dual-Speed, Plug-In Memory Available From CMI for PDP-11

BEDFORD, Mass. – A dual-speed main memory that plugs directly into the memory chassis of all models of the Digital Equipment Corp. PDP-11 minicomputer has been introduced by Cambridge Memories, Inc. (CMI).

The add-on memory system, called Semistor-11, is available with two types of 4K-bit "N" channel MOS storage devices which a PDP-11 user can specify in speed ranges which either duplicate or exceed the main memory speeds available on his processor. In both speeds, the memory is fully hardware- and software-compatible with all DEC-provided products, CMI said.

Semistor-11 memory boards are available in sizes of 8K, 12K or 16K 16-bit word/card and occupy a single slot in the processor's memory chassis.

Priced at \$2,300 per 16K by 16-bit card, Semistor-11 is approximately 25%

less costly than equivalent DEC memory, CMI added.

The firm is at 12 Crosby Drive, 01730.

TI Reduces Memory Prices

HOUSTON – Texas Instruments (TI) has reduced memory prices for the Model 960B and 980B minicomputers up to 38%.

Under the new schedule, 16-bit 8K words of memory now sell for \$1,400. The 900 series memory modules, available with up to 24K words of memory per board, incorporate TI's 4K random-access memory (RAM) devices. A spokesman said they are currently experiencing over 100,000 hours mean time between failure on 8K boards with TI's error-correction circuitry.

The firm can be reached through P.O. Box 1444, 77001.

Custom Systems Adds Line of Controllers

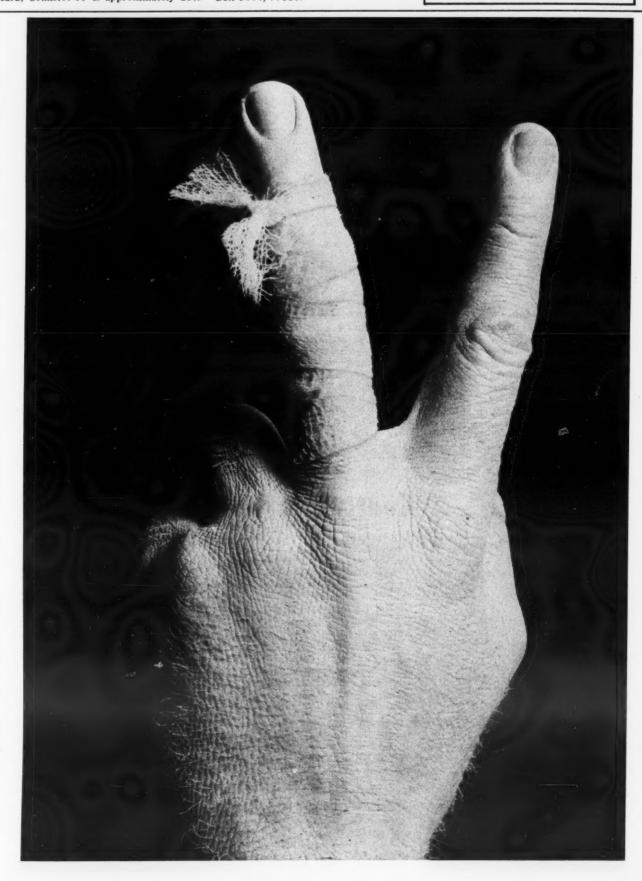
MINNEAPOLIS — Custom Systems, Inc. has designed a line of paper tape reader and punch controllers, the Series 150, for Data General Corp. and Digital Computer Controls, Inc. D-116 minicomputers.

The controllers are designed to operate with Remex, Iomec, Inc. and other popular paper tape readers and punches, the company said.

Controllers are supplied as a package including controller board, all required cabling, installation instructions and a software diagnostic.

Units are guaranteed fully compatible with the minicomputer manufacturer's software, the vendor said. The controllers for a reader or a punch cost \$510, and a combination controller costs \$850.

The firm is at 4935 Boone Avenue North, 55428.



Media III Provides Nova-Based System, Peripherals

ANAHEIM, Calif. — Users considering the selection of Data General Corp. (DG) minis for their DP needs might take a look at Media III which provides not only a completely integrated Nova-based system, but also a series of interfaced peripherals.

The Media III Model 1000S disk-based mini finds its primary application in DP and storage for small businesses and for program development.

The system has a 16K Data General Nova, 2.5M-byte disk memory and a keyboard/page printer with paper-tape reader/punch.

The \$9,995 system is supplied with a disk operating system with file management and single-user Basic capability. Also included is an automatic program load feature from disk to minicomputer main memory. The system is also completely compatible with and will run Data General's RDOS software, the firm said.

Options include disk storage to 320M bytes, main memory expansion to 128K

bytes, swapping disks, high-speed line printers, CRTs, multiuser time-share operating systems and IBM-compatible magnetic tape units.

Solid State Swapping Memory

The Media III Model 1301-108 solidstate swapping memory is a high-speed replacement for fixed-head swapping disks in multiterminal systems using Data General computers.

The computer can "worst case" access any data block within the swapping memory in 2 μ sec. This compares with an average access time of 8.3 msec inherent in swapping disks.

Typical word transfer rates for swapping disks are 120,000 word/sec, word transfer rates for the swapping memory can be 500,000 word/sec, the firm said.

Since the swapping memory is not "rotating," the speed of transfer is a function of the computer program. These features of the swapping memory can easily improve terminal response speeds by a fac-

tor of 10, thus permitting more terminals to be serviced by the system without a decrease in individual terminal response rates, Media III claimed.

Each memory board contains 2K 16-bit words of random-access memory (RAM) chips. A full complement of memory boards provides a total of 32K of memory. Up to four chassis may be daisy chained together for a total capacity of 128K of swapping memory. The suggested minimum configuration is 16K.

Software instructions transfer data between the computer and swapping memory through the direct memory access (DMA). From a software standpoint, the swapping memory is treated as a swapping disk, i.e., a block transfer device. Prices start at \$8,500.

Mini Disk System

The Media III Model 2610-040 mini disk system for Data General minis uses fixed media, moving-head disk drives. The systems, according to the firm, is particu-

larly suited for dedicated applications using the Nova 2/4.

The basic system comprises one disk drive, a Media III Model 2601 disk controller, all required cables, documentation

and software.

Software supplied includes a diagnostic routine and reliability routine. The system is software-compatible with all Data General 4047 disk software, including RDOS. The Media III Controller can control four daisy-chained disk drives. A complete 2.5M-byte system is \$4,495.

The latest member of a family of mass storage systems from Media III is the Model 2620-06X moving head disk system that provides storage capacities up to 266M bytes. A basic system includes one Control Data Corp. Model 9760 storage module drive (SMD), one Media III Model 2602 controller, all required cables, documentation and diagnostic software.

This basic system uses a removable disk pack with a formatted storage capacity of 33,341,440 bytes. A maximum of four SMDs can be attached to one controller. The CDC Model 9762 SMD may be substituted for the Model 9760, providing a basic system capacity of 66,682,880 bytes and a full expanded capacity of 266M bytes.

The system is software-compatible with Media III Model 2610 disk cartridge systems and with Data General Model 4047 disk systems, Media III said.

Prices on the moving-head disks start at \$15,000 from the firm at 2259 Via Burton, 92806.

Digiac MP-12 Trains Students

SMITHTOWN, N.Y. – Digiac Corp., a Fabri-Tek subsidiary, has configured that firm's MP-12 minicomputer into a trainer for vocational schools.

Called the Com-Tran 20 (CT-20), the unit is designed to give students hands-on, practical experience in computer concepts, process control, data processing, digital electronics and programming.

Because of its modular construction, the CT-20 can be configured into a minicomputer by plugging in the appropriate I/O interface.

The CT-20 can use Focal or Basic pro-

gramming languages.

A 4K CT-20 with power supply and cabinet costs \$3,540 from the firm at 175 Engineers Road, 11787.

Clarification

MDB Systems, Inc., vendor of the MDB-11B DMA controller [CW, April 9] is at 981 N. Main St., Orange, Calif. 92667.

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At Hanover Fair in West Germany

U.S. Exhibitors Optimistic About European DP Market

By Vic Farmer

Of the CW Staff
HANOVER, W. Germany - The optimistic words of the general and marketing directors of a cross section of U.S. subsidjaries surveyed at the recent Hanover Fair project the German DP market for U.S. goods should continue to improve over

the next two years.

DP firms here pretty well missed the near-depression the U.S. had in 1970 to 1971, but the oil crisis and the present generally depressed state of the world has caused most German as well as U.S. companies here to show considerably smaller profits over the last six months. All are concerned, but also optimistic that the poor times are over.

Dieter F. Sauer, director for market development for Univac Germany, said the firm has sold 10 90/30s over the past 10 months, but he thought a 20% to 25% improvement could easily come through over the next year.

One-third of the present orders for 90/30s came from IBM sites, he said.

The recent release of the 90/30, compatibility with the System/3, VS on the larger 90s and the 1100/20 and 40 have provided the sales crew with plenty of competitive ammunition against IBM Siemens and Honeywell-Bull, Sauer said.

The firm's goal is also to sell at least seven of the larger 1100/20s over the next year, he said.

NCR Germany

Detlef Hoffman, marketing director of NCR Germany, said his company just installed its first Century 300 at a bank and predicted six to eight more installations of the large NCR machine by the middle of 1976.

NCR here, as in the U.S., is continually fighting the cash register image. The firm has a major portion of cash register business, and the presence of large computer installation is an important image builder, Hoffman said.

NCR sold eight of its smaller 8200

computer systems right here at the fair. This gives a total of 25 systems sold since the 8200's introduction here in January. even though first delivery of this entrylevel system is not scheduled until September.

This year, 34% of visitors to NCR's equipment booth, nearly double over last year, have asked to see DP products.

Although NCR, as well as IBM and Nixdorf Computer AG, were demonstrating supermarket Universal Product Code (UPC) scanners, Hoffman said the great diversity of products and suppliers of packaged foods in Europe may not make UPC practical here for many years.

E. Karl Hirth, general manager of Computer Machinery Corp. (CMC) Germany, said the first three months of 1975 were very slow.

His sales staff has 100 hot proposals, with 50 slated for CMC, if the users can get money allocated to new products. Many of them operate their keypunch systems at only 60% to 70% efficiency.

Hirth was more conservative, predicting late 1976 before the German market would turn up. Explaining the composi-



Jochen Kaniss



Detlef Hoffman



Dieter F. Sauer

tion of the German key-to-disk installed base, Hirth said Inforex, Inc. and Entrex, Inc. (marketed by Nixdorf) were first, Mohawk Data Sciences (MDS) and CMC tied for second, followed by Four-Phase Systems, Inc. (marketed by Philips) and Consolidated Computer marketed by International Computers Ltd.

CMC has over 125 installations, double from last year, and projections indicate

another doubling in 1975, Hirth said. Dr. Eckhard Schutz, MDS Germany marketing director, agreed with Hirth on the slow state of the key entry market and he predicted the next two years would be critical for all key-to-disk vendors in Europe.

Users are evaluating intelligent clustered terminal systems and, at the same time, competition is increasing both from keyto-disk makers as well as the terminal makers, he said.

Because users are evaluating clustered (Continued on Page 30)

to 'Produce More

By Molly Upton Of the CW Staff

PITTSBURGH - In line with IBM's goal in 1975 to "produce more with less," IBM is reassigning some personnel within the firm to achieve a balanced workload.

Chairman Frank T. Cary told stock-

holders at a meeting here last week. IBM is seeking to fill most job slots from within and hiring only those with

certain critical skills, he said.

As an example of balancing the workload, Cary said some DP sales personnel are being moved to sales in the General System Division, and production personnel in the Office Products Division are being trained as customer engineers of

those products.

While forecasters are anticipating general economic recovery will begin sometime in the second half of the year, Cary said IBM is not sitting around waiting for conditions to improve.

"We are helping our customers identify additional opportunities to use IBM equipment, improving the management of our assets and investing in the future through research and development," he

Cary disclosed little about future projections of IBM earnings, telling a shareholder he makes it a point not to make earnings forecasts. "I am very often wrong and don't want to mislead you," he said.

He said, however, he is very optimistic about the future of IBM. "There has never been a time when technology was moving more rapidly, or when we had more exciting developments in our laboratories."

Cary took care to differentiate between the firm's sales and rental revenue streams, noting that outright sales, which were particularly high in the first half of 1974, cause sharp swings in the firm's

The rate of incoming orders in the first quarter of 1975 was lower than in any period in 1974, he said. Citing the first quarter's relatively flat earnings compared with those of a year ago, he observed the drop in outright sales combined with inflation to largely offset price hikes and

increased growth in other parts of the company.

Cary spoke strongly against legislation that would cause corporations to pay taxes twice on income earned abroad and urged stockholders to write their congressmen on this issue.

"In recent years, some members of Congress have repeatedly proposed tax legislation which would result in double taxation of the foreign income of American companies," Cary said.

"These proposals, had they been enacted, would have resulted in raising IBM's tax rate on foreign income from approximately 50% to over 70%. Clearly, this would make it impossible for us to compete effectively overseas," claimed.

IBM is very happy about the appeals court decision in its favor in the Telex case, he said.

What pleases the company most is that the decision was a "reaffirmation it is not necessary in our economy to apologize for competing vigorously and effectively," he said.

When asked about the possibility of a consent decree in the antitrust case brought against IBM by the government, Cary said IBM is not negotiating with the Justice Department, but it "certainly would be happy to talk to them if Justice wanted to discuss the idea.

The meeting, which lasted slightly over three hours, saw the ratification of all (Continued on Page 29)

Against IBM Four Amend Suits

SAN FRANCISCO - Hudson General, Transamerica Corp., California Computer Products (Calcomp) and Marshall Industries entered amended complaints in their suits against IBM.

Hudson General's complaint was broadened to redefine markets and practices, such as those included in the systems market, a spokesman said.

The complaint added a number of acts cited by the Justice Department in its pretrial brief with IBM.

Hudson said it would be willing to be bound by the result of the Calcomp-IBM antitrust litigation, he added.

Calcomp sought to have its trade secret

dispute with IBM split from its antitrust charges and tried next February.

Calcomp asked for a trial on its antitrust charges four to six months after the conclusion of the IBM-Justice case.

Transamerica's amended complaint includes the impact of IBM's actions on Transamerica's portfolio of Marshall disk drives as well as its Telex equipment, a spokesman said.

Damage claims were increased to \$60 million from \$50 million before trebling,

Marshall broadened its complaint to include markets in peripherals and DP sys-

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RAYTHEON DATA SYSTEMS

Cary Tells Stockholder Meeting IBM to 'Produce More With Less'

(Continued from Page 28) proposals submitted by the corporation and the rejection of three proposals submitted by stockholders, including one that essentially called for withdrawal from South Africa.

Another stockholder proposal, which asked the IBM board to affirm the corporation's political nonpartisanship by avoiding practices relating to soliciting employee contributions for one party, received the most votes, 3.7 million, of any of the defeated proposals.

IBM indicated such solicitations, both nonpartisan and partisan, are prohibited altogether.

The motion on business in South Africa submitted by a coalition of 14 church groups probably received the most comments, but received the smallest number of votes, 1.95 million, of any of the three stockholder proposals.

In speaking for the motion, Robert Powell said, "We charge IBM with being an accomplice in international crime against humanity" and argued computers are used to run the apartheid system more smoothly.



Cary said, "We believe we should stay and stay involved, set a good example and be a positive force for change."

No Answers From Cary

Cary received applause and some of the persistent questioners were greeted with groans intermixed with boos during the meeting as the patience of some attendees

But interspersed with the myriad of remarks that were tangential to matters being discussed or proposed, some sharp questions were asked, and not all received

Cary refused to answer Evelyn Y. Davis' question on the amount of legal fees paid by the corporation during the year or the amount paid to Cravath Swaine & Moore, the firm handling the Telex and Justice Department cases.

It is not wise to talk about total legal costs because of the way some people might use that information, he said. Costs are high, both in dollars and management time, he added

He did say IBM paid its accountant, Price Waterhouse & Co., \$2.7 million during 1974.

Replying to another question, Cary said the amount paid to the employees' special opportunity plan for early retirement after 25 years of service was the largest of several items included in the "10K report" that totaled about \$92 million.

Cary did explain the \$250 million prepayment for the pension fund, indicating such prepayment was necessary since the market value of the securities in the portfolio did not equal or exceed the present value of vested interest.

One stockholder queried Cary on IBM's methods of making its views known to Congress. Cary said he or Gilbert Jones, vice-chairman of the board, or Nicholas Katzenbach, vice-president and general counsel, call on congressmen.

But when asked if records of these calls and the positions advocated were available to stockholders upon request, Cary said "If I think you have a right to right to know.

Occasionally repartees brought laughter to the more than 1,200 attendees in the elegant Heinz Hall here.

For instance, Cary to Davis: "IBM's plan for variable compensation has nothing to do with Catfish Hunter."

After Cary had, in schoolmaster manner, said, "Let's see if we can't confine ourselves to the proposals," one person said in a loud voice, "I appeal the decision of the chair."

But Cary got unexpected help from Davis, usually a protagonist, who told the man in no uncertain terms, "Oh, sit

Davis and Beatrice Kalekian, another frequent attendee of stockholder meetings, both opposed the resolution on South Africa, finding themselves in agreement with IBM management.





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Drum Maker Doubles Production, Slashes

HAWTHORNE, Calif. - General Instruments was able to double production of memory drums at a fraction of the cost by converting from carbide and singlecrystal diamond cutting tools to polycrystalline diamonds, the firm said.

The switch reduced setups by one-third, halved the number of tool changes and eliminated three out of five machining passes on each drum.

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diamonds, we were producing 60 to 65 drums a month," said Rudy Padilla, General Instruments production supervisor.

"Now our production is up to 125 drums a month.

"We were getting about 45 memory drums per diamond tool, then another 45 after an expensive relapping operation. Cost per 90 drums was \$200 - \$125 purchase cost for the diamond, then \$75 for relap. That's about \$2.22 per drum, not counting the cost of the carbide tooling.

"Now," continued Padilla, "we get 80 to 100 drums per cutting surface, and since the polycrystalline diamonds have eight cutting surfaces, that's a total of 650 to 800 drums per \$34 tool, or about 5 cents per drum.

The polycrystalline diamond indexable inserts are formed from pure diamond powder through a sintering process and are available in disks and triangles as well as squares. They are made by Megadiamond Industries, 589 Fifth Ave., N.Y.

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(Continued from Page 28) terminal systems, MDS here has found users generally acquire key-to-disk systems under a three-year lease.

MDS was profitable in Germany for 1974. In response to Nixdorf offering mini Cobol with its Entrex key-to-disk system, MDS Germany has designed a self-interpreting program generator which

will probably be sent to the U.S. in the near future.

Data 100 Germany

Jochen Kaniss, marketing director for Data 100 Germany, however, said terminal use through the nation's telephone system is expensive and users select small systems as alternatives quite often.

Over the past two years, Data 100 has sold over 200 terminals, but 50% of its business here is in key-to-disk systems and the total subsidiary's annual growth is running at about 30%, he added.



Gerd Grobbink

Modems are only available through the national telephone system and a 1,200- to 2,400 bit/sec modem on a dial-up line is priced at \$190/mo, Kaniss said.

Hartmut Schlenk, marketing director of Sanders, added that the terminal market also is influenced by the "Centralization" inclination of German management and this attribute leads to a situation where most of the Sanders terminals, 80%, are installed locally and without modems.

Schlenk is also optimistic about future business, projecting a tripling of business over each of the next couple of years.

After 18 months in Germany, Sanders has 150 terminals in 30 installations, but Schlenk emphasized most of the first year was devoted to establishing Sanders' name in the market.

Gerd Grobbink, general manager of Singer Computer Germany, classified the first quarter as "excellent," but slightly less so than the last six months of 1974.

Singer has 150 System Tens in Germany and has emphasized tailored packages to distributors, breweries, insurance and shipping agents.

Singer started here two years ago with the System Ten and estimates it will sell another 100 in 1975, Grobbink pre-

Singer also has about 700 Series 1500 terminals installed and he anticpates another 400 to 500 this year.

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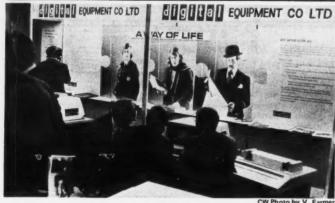
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Caravan, British-Style

A Digital Equipment Corp. Datasystem 310 was sold off the floor at the Computermarket in Leeds, England. The show, presented by the Computer Caravan, featured exhibits of nine minicomputer makers

Tally Sees Growing Mart For 300 Line/Min Printer

By Molly Upton Of the CW Staff

KENT, Washington - Tally Corp. is bringing out a 300 line/ min printer, the Series 4300, because that's where one of the growing markets for line printers is, Bob Malone, marketing vicepresident said in a recent interview here.

The unit uses technology similar to that incorporated in its 200 line/min units, he said, but offers a wider carriage, 19 inches; improved slew paper rates; a cartridge ribbon; and higher level medium-scale integration (MSI) logic, he said.

The 300 line/min unit is priced at little more than the 200 line/ min printer, he said.

While Tally's business is pres-

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GML Corp. 594 Marrett Road Lexington, MA 02173 ently almost totally OEM, Malone said he would like to see more end-user business, about 10% to 20% of the total.

The firm has a nationwide service force for its Datascribe keyto-tape communications unit and is prepared to support more end users in the printer area, he

Malone sees users moving from serial printers to line printers as they need increased reliability. In conjunction with this, prices on line printer units are expected to drop somewhat, thus narrowing the gap between the two, he said.

Tally has taken several steps to increase the compatibility of its new printer. A 12-channel option enables it to be used with small business systems that compete with the IBM System/3, he said. Tally also has an outfit developing programmable interfaces for use with the printer.

In addition, Tally offers a onecard option that emulates other makes of printers such as those of Centronics Data Computer Corp. and Data Products Corp. This saves the OEM buyer from

designing additional interfaces, Malone explained.

Tally's order business has been holding okay, said Malone, who added that its European subsidiaries are doing very well, providing a substantial buffer for the firm.

He hasn't seen much stretching out of deliveries, but almost the reverse. Customers tend to order late and demand short delivery times, in an effort to cut down on their own inventories.

Tally plans to introduce a new punched tape unit, he said. Although he doubts that the market for punched tape is growing in terms of dollars, there are new uses emerging for it, he said, such as in programmable readonly-memory (ROM) programming units.

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Memory Makers Report Lowered Results

Two memory makers, Cambridge Memories, Inc. (CMI) and Fabri-Tek, Inc., reported decreased sales and earnings for recent periods.

At CMI; second-quarter results helped overcome the first quarter loss, with a resulting sixmonth earnings of \$148,000.

At Fabri-tek, however, the third quarter caused a loss of \$119,000 for the nine months. Second-quarter results at CMI "continued to reflect the delay in certain new products combined with deferral of capital spending by many customers," Joseph F. Kruy, the company's president said.

Earnings for the second quarter ended March 1 declined to \$46,000 or 3 cents a share compared with \$205,000 or 15 cents a share in the year-ago period, when there were 27% fewer shares outstanding.

Quarterly revenues also dipped, to \$5.2 million compared with \$5.6 million in the same 1974 period.

For the six months, however,

revenues grew, to \$10.9 million compared with \$10.5 million in the year-ago period.

Earnings dropped to \$148,000 or 9 cents a share compared with \$427,000 or 32 cents a share in the 1974 half.

Fabri-Tek has instituted direct marketing of its line of IBMcompatible memories, previously being sold through agents.

The third-quarter loss resulted primarily from customer rescheduling of OEM memory shipments and a reduced level of orders for IBM-compatible memories sold through agents, according to L.D. Altman, Fabri-Tek president.

Cost-cutting actions have been taken throughout all sectors except National Connector and UK operations, which are expected to continue to operate very profitably, Altman said.

For the third quarter ended Dec. 27, Fabritek lost \$557,000 or 15 cents a share compared with earnings of \$1.1 million or 33 cents a share in the year-ago

million of that probably will be

delayed for customer shipment

until after December 1975 be-

cause of customer uncertainties.

portable data entry terminals

used in merchandise ordering,

said it is taking steps to reduce

costs and expenses in prepara-

tion for a more moderate growth

The company, which makes

period, when there was \$319,000 tax credit.

Revenues dipped for the third quarter to \$8.1 million compared with \$12 million in the same period last year.

The differences in revenue and earnings were smaller for the nine months. Revenues were \$27.1 million compared with \$28.3 million in the year-ago period.

Fabri-Tek lost \$119,000 or 3 cents a share compared with earnings of \$2.1 million or 64 cents, which included an \$830,000 tax credit, in the 1973 period.



AUSTRALIA

Authentic information is freely available WITHOUT CHARGE from the Australian Embassy in Washington, D.C. (202) 797-3000, and the Australian Consulate General in New York (212) 245-4000, San Francisco (415) 362-6160, Los Angeles (213) 380-4610 and Chicago (312) 329-1740.

MSI Earnings Soar 59% in Quarter, Growth Rate Moderation Expected

COSTA MESA, Calif. – MSI Data Corp. showed third-quarter earnings rising 59% over the yearago period, but said it expects "recessionary pressures" to moderate its growth rate in the near future.

For the quarter, earnings reached \$472,042 or 24 cents a share compared with \$297,279 or 15 cents a share in the same period last year, while revenues rose 77% to \$9.6 million compared with \$5.4 million in the 1974 period.

Earnings and revenues continued their upward trend in the nine months, with earnings totaling \$1.2 million or 62 cents a share compared with \$793,163 or 41 cents a share in the same 1973 period.

Revenues rose to \$25.7 million compared with \$14.5 million during the same year-ago period.

Although backlog as of Dec. 31 rose to \$14.7 million compared with \$13.5 million, about \$2.3

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IBM Three Months Ended March 31

Earnings Reports

COMTEN Year Ended Dec. 31

| 111166 14 | ontilis Ended | March 31 | * | ear Elided Dec | . 31 | |
|-----------|---------------|-----------|----------|----------------|------------|--|
| | 1975 | 1974 | ata Fand | 1974 | 1973 | |
| | (000) | (000) | Shr Ernd | \$.36 | \$.30 | |
| Shr Ernd | \$2.95 | \$2.94 | Revenue | 13,705,000 | 9,156,000 | |
| Revenue | 3,271,998 | 3,001,741 | Tax Cred | 362,000 | 302,000 | |
| Earnings | 437,223 | 431,264 | Earnings | 779,700 | 631,700 | |
| | BURROUGHS | | | | | |
| Three M | onths Ended N | March 31 | | DATUM | | |
| | 1975 | 1974. | Y | ear Ended Dec | . 31 | |
| | (000) | (000) | | 1974 | 1973 | |
| Shr Ernd | \$.65 | \$.55 | Shr Ernd | \$.08 | \$.35 | |
| Revenue | 365,213 | 322,797 | Revenue | 14,559,000 | 10,268,000 | |
| Earnings | 25,628 | 21,376 | Earnings | 124,000 | 502,000 | |
| | | | | | | |

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BARRY WRIGHT Three Months Ended March 31 1975 a1974 IVERIA \$.13 \$.24 IVERIA \$ Shr Ernd Revenue Earnings a-Restated to reflect adoption of Lifo accounting method on about 50% of total inventories.

| | NICS DATA C | |
|----------|-------------|------------|
| | 1975 | 1974 |
| Shr Ernd | \$.41 | \$.43 |
| Revenue | 10,704,217 | 11,130,489 |
| Earnings | 1,959,486 | 2,050,897 |
| 9 Mo Shr | 1.17 | 1.18 |
| Revenue | 30,969,745 | 29,400,253 |
| Earnings | 5,587,746 | 5,675,300 |

| | COMPUGRAPH | |
|----------|--------------|------------|
| Three | Months Ended | March 30 |
| | 1975 | 1974 |
| Shr Ernd | \$.79 | \$.66 |
| Revenue | 18,803,000 | 15,819,000 |
| Earnings | 1,446,000 | 1,214,000 |
| 6 Mo Shr | 1.51 | 1.26 |
| Revenue | 36,735,000 | 29,169,000 |
| Earnings | 2,757,000 | 2,314,000 |
| | CONTROL DA | TA |

| | onths Ended | |
|--|-----------------------------------|-----------------------------------|
| | 1975 | a1974 (000) |
| Shr Ernd Revenue Spec Cred Earnings | \$.67 282,005 150 11,056 | \$.94 249,420 273 15,341 |
| a-Restated change. | to reflect an | accounting |

| | ATA DOCUME | |
|----------|--------------|------------|
| Three f | Months Ended | March 31 |
| | 1975 | 1974 |
| Shr Ernd | \$1.78 | \$1.77 |
| Revenue | 15,898,030 | 13,069,169 |
| Tax Cred | 2,000 | 26,004 |
| Earnings | 836,428 | 828,345 |
| 6 Mo Shr | 3.45 | 2.90 |
| Revenue | 31,559,510 | 24,068,116 |
| Tax Cred | 5,000 | 65,117 |
| Earnings | 1,621,156 | 1,361,236 |
| | | |
| | | |

HONEYWELL
Three Months Ended March 31 1975 a1974 \$.16 \$.74 606,024,000 588,903,000 92,000 6,086,000 16,263,000 Shr Ernd Revenue Tax Cred Earnings a-Restated change.

Computerworld Sales Offices

Neal Wilder

Sales Administrator: Dottie Travis COMPUTERWORLD 797 Washington Street Newton, Mass. 02160 Phone: (617) 965-5800 Telex: USA-92-2529

Northern Regional Manager Robert Ziegel **Account Manager** Mike Burman COMPUTERWORLD 797 Washington Street Newton, Mass. 02160 Phone: (617) 965-5800 Telex: USA-92-2529

Eastern Regional Manager Donald E. Fagan **Account Manager** Frank Gallo COMPUTERWORLD 2125 Center Avenue Fort Lee, N.J. 07024 Phone: (201) 461-2575

Vice President — Marketing Western Regional Manager: Bill Healey 1212 Hearst Bldg. San Francisco, Calif. 94103 Phone: (415) 495-0990

> Japan: Ken Suzuki General Manager Dempa/Computerworld 1-11-15 Higashi Gotanda Shinagawa-ku, Tokyo 141 Phone: (03) 445-6101 Telex: Japan-26792

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West Germany: Otmar Weber Computerworld GmbH 8000 Munich 40 Tristanstrasse 11 West Germany Phone: (089) 36-40-36

Telex: W.Ger-5-215350-HKFD

Computerworld Stock Trading Summary

All statistics compiled, TRADE*QUOTES, INC. Cambridge, Mass. 02139

| _ | . TRADE QUOTES | | | | |
|---|--|--|-----------------------------------|---------------------|--|
| F | | | PR [| CE | |
| X | | 1974 | CLOSE | WEFK | WEE |
| C | | RANGE | APR 30 | NFT | PC |
| H | | (1) | 1975 | CHNGE | CHNG |
| | con | APUTER SYS | TEMS | | |
| N | BURROUGHS CORP | 62-109 | 96 7/8 | +2 5/8 | +2. |
| ŋ | COMPUTER AUTOMATION | 2- 14 | 6 1/2 | - 1/4 | -3. |
| N | CONTROL DATA CORP | 10- 38 | 20 3/8 | +1 3/8 | +7. |
| N | DATA GENERAL CORP | 10- 38 5- 17 | 32 1/4 | + 1/2 | +1. |
| 0 | DIGITAL COMP CONTROL | 1- 5 | 2 | - 1/2 | -20. |
| N | DIGITAL FQUIPMENT | 46-121 | 109 1/4 | +3 | +2. |
| N | FLECTRONIC ASSOC. | 1- 3 | 2 3/8 | + 1/8 | +5. |
| A | FLECTRONIC ENGINEER. | 4- 11 | 8 7/8 | - 1/8 | -1. |
| N | FOXBORO | 19- 48 | 32 3/8 | -1 3/8 | -4. |
| 0 | GENERAL AUTOMATION | 6- 40 | 8 5/8 | + 1/8 | +1 - |
| 0 | GRI COMPUTER CORP | 1- 2 54-108 | 104 3/4 | - 1/2 | -0. |
| 2 2 | HEWLETT-PACKARD CO | 18- 86 | 30 | +2 1/4 | +8. |
| V | I BM | 152-251 | 209 7/9 | +1 7/8 | +0. |
| , | MEMOREX | 2- 5 | 7 | +1 7/8 | +36. |
| 3 | MICRODATA CORP | 1- 5 | 3 1/2 | - 1/8 | -3. |
| V | NCR | 14- 40 | 30 1/4 | + 1/4 | +0. |
| N | PERKIN-EL MER | 15- 40 | 27 42 3/8 | -1 +3 1/8 | +7. |
| V | RAYTHEON CO | 21- 44 | | | |
| ď | SPERRY RAND | 24- 44 | 41 1/2 | +1 1/4 | +3. |
| 1 | SYSTEMS FNG. LABS | 1- 4 | 3 1/2 | - 1/8 + 1/8 | +3. |
| 7 | VARIAN ASSOCIATES | 6- 13 | 9 3/8 | + 1/8 | +1. |
| V | WANG LASS. | 7- 20 | 12 1/8 | -1 1/2 | -11. |
| V | XEROX CORP | 50-127 | 74 3/8 | + 3/4 | +1.0 |
| | LEAC | ING COMPA | 1155 | | |
| | | | | | |
| 1 | COMMISCO INC | 1- 7 | 3 3/8 | + 3/8 | +12.5 |
| | COMPUTER INVSTRS GRP | 0- 4 | 7/8 | 0 | 0.0 |
| | DATRONIC RENTAL | 1- 1 | 5/8 | 0 | 0.0 |
| | DCL INC | 0- 1 | 1/2 | 0 | 0.0 |
| | DPF INC | 2- 5 | 4 1/4 | 0 | 0.0 |
| | FOP RESOURCES | 2- 3 | 4 3/8 | 0 | 0.0 |
| | GRANITE MST | 1- 5 | 4 3/8 | + 3/9 | +9.3 |
| | GREYHOUND COMPUTER | 3- 7 | 6 1/2 | + 1/8 | +1.9 |
| | TTEL | | | | |
| | TTFL LEASCO CORP | 5- 12 | 4 3/4 | - 7/8 | -15.5 |
| | LEASCO CORP | | | - 7/8 | |
| | LEASCO CORP LEASPAC CORP LECTRO MGT INC | 5- 12 1- 2 1- 1 | 4 3/4 1/2 1/8 | 0 | 0.0 |
| | LEASED CORP LEASPAC CORP LECTRO MGT INC NRG INC | 5- 12 1- 2 1- 1 1- 5 | 4 3/4 1/2 1/8 2 1/2 | 0 - 1/4 | 0.0 |
| | LEASON CORP LEASPAC CORP LECTRO MGT INC NRG INC PIONEER TEX CORP | 5- 12 1- 2 1- 1 1- 5 2- 10 | 4 3/4 1/2 1/8 2 1/2 3 | 0 - 1/4 - 1/8 | 0.0 0.0 -9.0 -4.0 |
| 1 | LEASED CORP LEASPAC CORP LECTRO MGT INC NRG INC | 5- 12 1- 2 1- 1 1- 5 | 4 3/4 1/2 1/8 2 1/2 | 0 - 1/4 | -15.5 0.0 0.0 -9.0 -4.0 0.0 |

| | - | | | | | | - | | - | | |
|---|--------|-------|-----|--------|-----|------|----|-------|-----|------|-----|
| EXCH: | N=NEW | YORK: | A= | AMERIC | AN: | Papi | HT | L-BAL | r-W | ASH | |
| .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | HITHES | | | | | | | |
| 0-T-C | PRICES | ARE | BID | PRICE | SAS | OF | 3 | P. M. | OR | LAST | BID |

| E | | | | | | | | | | |
|--------|------------------------------------|-------|------|-------|------|--------|--------|--|--|--|
| X | | | 1974 | | LOSF | WEEK | WEFK | | | |
| 4 | | | (1) | A | 1975 | CHNGE | CHNGE | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | SOFTWA | RE & | EDP | SERV | ICES | | | | | |
| 0 | ADVANCED COMP TECH | 1- | | 1 | | - 1/8 | -10.0 | | | |
| ٨ | APPLIED DATA RES. | 1- | | 1 | | 0 | 0.0 | | | |
| N | AUTOMATIC DATA PROC | 21- | | 53 | | +5 1/8 | *10.6 | | | |
| 0 | GENTRAL DATA SYSTEMS | 4- | | 3 | 1/8 | 0 | 0.0 | | | |
| 0 | COMPUTER DIMENSIONS | 1- | | 3 | | + 1/4 | *8.3 | | | |
| 0 | COMP ELECTION SYSTMS | 3- | | 3 | | 0 | 0.0 | | | |
| n | COMPUTER HORIZONS | 1- | | 1 | | 0 | 0.0 | | | |
| 0 | COMPUTER NETWORK | 1- | | 1 | 5/8 | + 1/8 | *8.3 | | | |
| N | COMPUTER SCIENCES | 2- | 4 | 4 | | 0 | 0.0 | | | |
| 0 | COMPUTER TASK GROUP | ¥ - | | | 5/8 | 0 | 0.0 | | | |
| 0 | COMPUTER USAGE | 2- | | 2 | | - 1/8 | ~5.0 | | | |
| 0 | COMSHARE | 2- | 4 | 3 | 3/4 | 0 | 0.0 | | | |
| n A | PATATAR FLECT COMP PROG | 1- | 3 | 1 | 1/4 | - 1/8 | -11.1 | | | |
| N | FLECTRONIC DATA SYS. | 11- | | 22 | 174 | +4 1/9 | +23.0 | | | |
| 0 | INFONATIONAL INC | 1- | 2 | 6.6 | 1/8 | 0 | 0.0 | | | |
| 0 | IPS COMPUTER MARKET. | 1- | 1 | | 3/4 | + 3/8 | *100.0 | | | |
| 0 | KEANE ASSOCIATES | 2- | 4 | 3 | 1/4 | 0 | 0.0 | | | |
| 0 | KEYDATA CORP | 1- | 6 | 2 | 5/8 | - 1/4 | -8.6 | | | |
| 0 | LOGICON | 2- | 5 | 5 | 1/8 | 0 | 0.0 | | | |
| Δ | MANAGEMENT DATA | 1- | 2 | 2 | | - 1/4 | -11.1 | | | |
| 0 | NATIONAL CSS INC | 5- | 37 | 9 | | + 1/2 | +5.8 | | | |
| D | NATIONAL COMPUTER CO | 1- | 1 | | 1/4 | 0 | 0.0 | | | |
| A | ON LINE SYSTEMS INC | 9- | 33 | 11 | 1/8 | +2 1/4 | +25.3 | | | |
| D | PROGRAMMING & SYS | 1- | 1 | 3 | 3/4 | 0 | 0.0 | | | |
| 0 | RAPIDATA INC | 1- | 5 | 3 | 3/8 | +1 1/8 | +50.0 | | | |
| 0 | SCIENTIFIC COMPUTERS | 1- | 1 | 1 | 2, 0 | 0 | 0.0 | | | |
| n | SIMPLICITY COMPUTER | 1- | 1 | | 1/4 | 0 | 0.0 | | | |
| 0 | TYMSHARE INC | 6- | 12 | 11 | 3/4 | + 1/4 | +2.1 | | | |
| 3 | UNITED DATA CENTER | 2- | 4 | 2 | 7/8 | 0 | 0.0 | | | |
| A | URS SYSTEMS | 2- | 4 | 2 | 5/8 | 0 | 0.0 | | | |
| ed. | WYLY CORP | 1- | 5 | 3 | 1/8 | 0 | 0.0 | | | |
| | PERTPHER | ALS I | S SU | RSYST | TEMS | | | | | |
| N | ADDRESSOGRAPH-MULT | 3- | 11 | 7 | 5/8 | 0 | 0.0 | | | |
| n | ADVANCED MEMORY SYS | 1- | 7 | 4 | 3/8 | + 1/4 | +6.0 | | | |
| N | AMPEX CORP | 2- | 5 | 4 | 3/4 | - 1/8 | -2.5 | | | |
| 0 | ANDERSON JACOBSON | 1- | 4 | 2 | 3/4 | - 1/8 | -4.3 | | | |
| 0 | REEHIVE MEDICAL FLFC | 5- | 7 | 7 | | + 1/4 | +9.0 | | | |
| A | BOLT, SERANEK & NEW BUNKER-RAMO | 3- | 8 | 6 | | 0 | 0.0 | | | |
| A | CALCOMP | 4- | 11 | 6 | | 0 | 0.0 | | | |
| 0 | CAMBRIDGE MEMORIES | 3- | 16 | | 1/2 | + 1/4 | +7.6 | | | |
| N | CENTRONICS DATA COMP | 7- | 23 | 17 | 1/4 | -1 1/8 | -6.1 | | | |
| 0 | CODEX CORP | 8- | 30 | 29 | 1/2 | +3 1/4 | +12.3 | | | |
| 0 | COGNITRONICS | 1- | 2 | 1 | 1/8 | + 5/8 | +125.0 | | | |

| . F | | | | 00.5 | | |
|-----|---|---------------|---------|-------|--------|----------------|
| X | | 197 | 4 (| CLOSE | WEEK | WEEK |
| C | | RANG | | PR 30 | NET | PCT |
| H | | (1) | | 1975 | CHNGE | CHNGE |
| 0 | COMPUTER COMMUN. | 1- | 2 | 1/2 | 0 | 0.0 |
| O | COMPUTER CONSOLES COMPUTER FOULPMENT | 2- | | 3 3/8 | + 3/8 | +12.5 |
| n | COMPUTER FOULPMENT | 1- | 2 1 | | + 1/8 | -14.2 |
| 0 | COMPUTER TRANSCEIVER | 1- | 2 1 | | - 1/8 | -8.3 |
| n | COMTEN | 1- | 5 3 | 3 | - 1/8 | -4.0 |
| N | CONRAC CORP | 10- 2 | 2 18 | 8 1/8 | -1 | -5.2 |
| 0 | DATA ACCESS SYSTEMS | 2- | 3 2 | 2 1/4 | - 1/4 | -10.0 |
| n | DATA 100 | | | 1/2 | +1 1/4 | +10.2 |
| A | DATA PRODUCTS CORP | | 5 4 | | + 5/8 | +16.1 |
| 0 | DATUM INC | | 4 1 | | - 1/8 | -9.0 |
| 0 | DECISION DATA COMPUT | | 3 5 | | - 5/8 | -10.4 |
| 2 | DELTA DATA SYSTEMS | | 2 | 1/4 | 0 | 0.0 |
| 0 | DI/AN CONTROLS | 1- | 2 1 | 1/4 | + 1/4 | +25.0 |
| N | ELECTRONIC M & M | | 4 2 | | 0 | 0.0 |
| 0 | FARRI-TEK | | 3 1 | | + 1/4 | +22.2 |
| O | GENERAL COMPUTER SYS | | 4 1 7 3 | | + 1/4 | +16.6 |
| 1/4 | HAZELTINE CORP | 2- | 7 3 | 1/4 | 0 | 0.0 |
| N | HARRIS CORP | 13- 34 | | | +2 1/2 | +13.6 |
| Δ | INCOTERM CORP | | 6 4 | | + 3/9 | +8.R |
| n | INFOREX INC | | 5 3 | | - 1/2 | -13.3 |
| A | INFORMATION INTL INC | 6- 14 | | | - 1/4 | -2.2 |
| 0 | MANAGEMENT ASSIST | | 3 2 | 1/2 | - 1/8 | 0.0 |
| 4 | MILGO ELECTRONICS | 6- 18 | | | +1 3/4 | -20.0 +11.6 |
| N | MOHAWK DATA SCI | 1- 6 | | | +1 3/8 | +50.0 |
| 0 | PPTICAL SCANNING | | 5 ? | | 0 | 0.0 |
| 0 | PERTEC CORP | | 9 6 | 3/4 | + 5/8 | +10.2 |
| A | POTTER INSTRUMENT | 1- 5 | | 3/4 | 0 | 0.0 |
| 0 | PRECISION INST. | 1- 3 | | 1/4 | 3 | 0.0 |
| 0 | RECOGNITION EQUIP | 2- 9 | | 3/4 | 0 | 0.0 |
| N | SANDERS ASSOCIATES | 2- 8 | | | - 1/8 | -2.5 |
| 0 | SCAN DATA | 1- 3 | | 3/4 | + 1/4 | +10.0 |
| 0 | STORAGE TECHNOLOGY | 6- 15 | | | +1 3/8 | +14.2 |
| 0 | SYCOR INC | 4- 13 | | 1/4 | + 3/4 | +8.8 |
| 0 | TALLY CORP. | 1- 4 | | 3/8 | + 1/4 | +8.0 |
| 0 | TEC INC | 1- 7 | 5 | 1/2 | 0 | 0.0 |
| N | TEKTRONIX INC | 18- 49 | 32 | 1/4 | - 1/4 | -0.7 |
| N | TELFX | 1- 4 | | | + 1/4 | +14.2 |
| 0 | WANGCO INC | 3- 13 | 3 | 3/4 | + 1/8 | +3.4 |
| n | WILTER INF | 1- 8 | 2 | 3/4 | + 1/2 | +22.2 |
| | SUPPLI | ES & ACC | ESSOR | 1FS | | |
| 0 | BALTIMORE BUS FORMS | 4- 6 | 5 | 1/4 | 0 | 0.0 |
| A | BARRY WRIGHT | 4- 7 | | | + 1/2 | +9.0 |
| 0 | CYRERMATICS INC | 1- ? | | 5/8 | 0 | 0.0 |
| A | DATA DOCUMENTS | 23- 54 | | | -1 | -2.7 |
| 0 | DUPLEX PRODUCTS INC | 6- 25 | | 1/8 | +2 3/8 | +10.9 |
| N | GRAHAM MAGNETICS | 4- 7 5- 11 | | 3/4 | - 1/4 | -3.5 |
| 0 | GRAPHIC CONTROLS | 5- 11 | | 1/4 | + 1/4 | +3.5 |
| N | 3M COMPANY | 43- 79 | | 7/8 | +2 1/8 | +3.6 |
| 0 | MODRE CORP LTD | 33- 57 | | 110 | - 3/4 | -1.6 |
| N | NASHUA CORP | 15- 45 | | 3/9 | +2 3/4 | +17.5 |
| 9 | REYNOLDS & REYNOLD - | 6- 35 | | | - 1/2 | -2.3 |
| 0 | STANDARD REGISTER | 10- 18 | | | 0 | 0.0 |
| O N | TAB PRODUCTS CO | 4- 11 | 7 | | + 1/2 | +7.6 |
| 0 | VANIER GRAPHICS CORP | 13- 23 | | 1/8 | - 1/8 | -0.6 |
| A | WABASH MAGNETICS | 3- 7 | | 7/9 | + 3/4 | +12.0 |
| N | WALLACE BUS FORMS | 14- 25 | 24 | 1/4 | + 3/8 | +1.5 |
| | | | | | | |

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